Botanical contributions overlooked: the role and recognition of collectors, horticulturists, explorers and others in the early documentation of the Australian flora

'In the very title page we see them robbed of the reward of their erudition . . .' (Ker-Gawler 1823)

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Abstract

Many of the earliest Australian plant names were published in illustrated magazines and horticultural lists in Britain and Europe. The authorship of these names can be obscure. Social attitudes of the day influenced who was able to publish and whether or not their work was acceptable. As a result the contributions of such people as the gardeners John Kennedy and James Lee, the Linnaean scientists Daniel Solander and Jonas Dryander, and the scientific outcast Richard Salisbury are not well known. A number of manuscripts placed in the care of Joseph Banks by Solander and other early collectors such as James Anderson, George Bass and William Paterson were never published by Banks. Their authors as a result lost credit for their observations. Robert Brown's *Prodromus*, the first attempt at a flora of Australia, is partly a synthesis of the work of many of these unacknowledged people.

With the growth of settlements in Australia in the early to mid 1800s, many of the educated resident collectors provided more than just collections of plants to botanists, particularly to those in Britain. In their correspondence they often provided short descriptions of the plants, commented on their novelty, and sometimes named them. In the present day it is likely that the principal recipients of their collections, Robert Brown, John Lindley and William Hooker, would have published the many new plants they described and named under joint authorship. The failure of resident collectors such as Allan Cunningham, Charles Fraser, Ronald Gunn, James Backhouse, James Drummond and Ludwig Leichhardt to publish many or any of their observations themselves led to their losing credit for much of their original work. Thomas Mitchell was one who took steps to gain maximum credit for his contributions by personally supervising the publication of the journals of his four expeditions and their botany. Reliance on 'mother' Britain, both politically and scientifically, still existed and attempts to form scientific societies in Australia were in their infancy. It was not until the coming of Ferdinand Mueller that scientific publishing took place within Australia. Mueller's effect on documentation of the Australian flora within Australia is briefly touched upon.

The identity of many early collectors of Australian plants has also been obscured, partly no doubt through the social attitudes of the time. The published journals of a selection of the early expeditions, both maritime and into the interior of Australia, indicate that collections were often the result of more than just the principal botanist, such as Robert Brown on Flinders's voyage, or the expedition leader, such as Thomas Mitchell or Charles Sturt.

The implications for taxonomy of these overlooked contributors is discussed with respect to the citation of authorship of early names and their typification. Differences in pagination of the two editions of Thomas Mitchell's *Three expeditions into the interior of eastern Australia* are detailed in an appendix.

Contents

Introduction

Taxonomists frequently come into contact with history. Documentation of the changing distribution of native species and aliens, and the derivation of names, all require recourse to old literature. The most frequent use of history in taxonomy, however, is in the achievement of correct and therefore stable nomenclature through the determination of the principal type specimen of names. This procedure, called typification, requires interpretation of the original documents in which a species was described.

In this paper we review a selection of the published literature to discover the extent to which the current view of the participants in the documentation of the Australian flora is a just one. We have concentrated on British involvement, not only because of our difficulty with non-English languages and poor representation of foreign history books in our libraries, but also because this is so central to the history of Australian plant systematics.

Many Australian species were originally described in Europe by well-known names of botany, such as Robert Brown, the Hookers, father and son, and George Bentham. Not until Ferdinand Mueller's time were descriptions published in Australia. All of these people relied heavily on the acquisition of specimens from collectors. Only rarely, as in the case of Jacques Labillardière, Robert Brown and Ferdinand Mueller, were significant personal collections made by the botanist himself.

The first major botanical collection from Australian shores was that of natural scientists Joseph Banks and Daniel Solander in 1770 on Cook's voyage. Their failure to publish the results of this gathering has made them, by default, collectors only. Similarly, 30 years later the botanist on Flinders's voyage, Robert Brown, produced a detailed manuscript on the Australian flora known to that time. Only part of this work was ever published, in the form of a concise *Prodromus* (Brown 1810b). For that part of the flora which was not covered within this publication he too is now in effect merely a collector.

The early collectors of Australian plants rarely concentrated on botany alone. As a result of the great demand for natural history specimens in general, there is much overlap in the early history of zoological, geological and botanical collecting in Australia (Finney 1984).

These early collectors came from all walks of life and had diverse backgrounds. They ranged from the gentry to anonymous convicts and Aborigines, from those trained in medicine and natural history to those lacking any formal education. Some came to New Holland specifically for the purpose of collecting plants. Among these were Ludwig Preiss, George Caley and Robert Brown, while some, such as Allan Cunningham, Ludwig Leichhardt and George Bass, combined the functions of collecting and exploration. Others such as Charles Sturt, Thomas Mitchell and Ernest Giles were primarily explorers but brought back natural history oddities. Still others were the often anonymous subordinate members of collecting parties and exploring expeditions.

How were the contributions of these people acknowledged by the scientists and nurserymen who

used their collections? Has science recognized them subsequently? Our research, predominantly into the British collectors of higher plants, has shown that the acknowledgement was as varied then as it is today. Recognition has not always been given to those who most deserved it.

Following a brief background introduction, discussion centres on three main themes. The first is given to consideration of the naming of plants in Britain and Europe following the arrival of the first botanical specimens from Australia. By looking at some specific examples it will be illustrated that a number of botanists of the time were not adequately recognized for their work. The second theme deals with the activities of a number of collectors within Australia and assesses their input into botanical names subsequently published, for the most part in Britain. The shift of authorship to Australian botanists, begun principally by Mueller, is briefly considered. The third theme is a comparison of the role played by more or less anonymous gatherers with that of their more publicised associates in the early searches for Australian plants. Finally, the implications of findings of this review upon nomenclatural aspects of systematic work are considered.

I. Background

The founding of Australia coincided with a great interest in Europe in natural history. The expanding empires of Britain and France in particular had led to the introduction into Europe of many novelties, both zoological and botanical. The introduction by Linnaeus of the binomial system of nomenclature together with his sexual system of classification meant that there was now a practical method of documenting and comparing the plants of the world.

Initially in England the principal proponents of the new methodology were two Swedish students of Linnaeus, Daniel Solander and Jonas Dryander, both in turn employed by Joseph Banks. Their careful cataloguing of the multitude of botanical novelties which were sent to Banks provided the foundation for many botanical publications, including those on the Australian flora.

Interest in botanical oddities was also promoted in other ways. Kew Gardens was established under the auspices of Royalty and at about the time of Joseph Banks commencing as its horticultural adviser in 1772 it became the principal European repository for plants from overseas (Blunt 1978). Many of the nobility shared this interest with their king and they also sought unusual plants for their gardens. In response to this demand a number of nurseries were either established at this time or expanded. Plant collectors were dispatched by the nurseries and botanical gardens to poorly known parts of the world, and there was a significant exchange of material, both living and dried, among European botanic gardens, nurseries, individual botanists and gardeners (Nelson, this volume).

Voyages of discovery that were commonly undertaken at the time invariably had a number of naturalists on the staff, among them usually a botanist and a gardener. Among British expeditions, James Cook on his first two voyages had three naturalists with two on his last, while Matthew Flinders had one naturalist and one gardener. On the French expedition of 1791–1794 in search of la Perouse, d'Entrecasteaux had five naturalists and one gardener. Nicholas Baudin, who had previously led botanical voyages to the Orient and the South Seas, set out in 1800 for New Holland with 24 scientists; of these three were botanists and five gardeners. Most of them died or deserted before the major work on the Australian coastline took place (Marchant 1982; Brosse 1983).

Artists also became a necessary component of these voyages. Before his first voyage with Cook to Tahiti, Joseph Banks had already employed the renowned botanical illustrator Georg Dionysius Ehret to depict some of the plants he had collected in Newfoundland. For this new expedition he was encouraged by his friends in the Society of Arts to employ an artist to depict the landscapes and another to record the plants and animals (Smith 1984). Such a suggestion had been made some years previously in both English and French accounts of voyages, but Banks was the first to put this idea into practice. Banks employed Alexander Buchan for the landscapes and Sydney Parkinson for the natural history specimens. While both of these artists were to die on this voyage, Parkinson's prodigious output of about 740 illustrations ensured that later voyages had the services of at least one artist.

One further fact promoted interest in natural history. No longer was the subject being presented purely in Latin but works were beginning to appear in the language of the author. Thus, at about the time of the founding of the colony at Port Jackson, interest in botanical novelties was combined with artistic representations of such plants, often with an account of the plant in the language of the country and above all a 'simplified' name in the form of a binomial.

II. Documentation of botanical novelties in Europe

The means of documentation of the incoming plants varied. Descriptions of new species appeared in the results of the voyages of discovery, for example William Dampier's account of the natural history of northwest Australia from his 1699 voyage (Williamson 1939) and Labillardière's (1805) *Novae Hollandiae plantarum specimen* from d'Entrecasteaux's voyage. They also appeared in annotated lists and catalogues of the holdings of nurseries and public and private gardens. A further important vehicle of publication were illustrated magazines specializing in new introductions.

Often the title pages of these illustrated magazines did not tell the full story. The author whose name appeared there rarely produced the work unaided. The forms of assistance varied, as did the acknowledgement. Help was often given in the provision of collections either from Australia through seed collectors, explorers or naturalists, or from nurserymen in Europe who cultivated material sent from Australia to satisfy public demand. Unpublished manuscripts provided another source of information which was often not acknowledged.

The authorship of botanical names is another way in which the contribution of botanists to their science can be gauged. However, the present rules for citing

authorship of botanical names are ambiguous and, as will be shown, can present a distorted view of the contributions of some botanists. Real contributions by people not involved in the mechanics of publication have often been overlooked.

A. Manuscripts and publications arising from Cook's three voyages

Solander's manuscripts

> *Solander's name will appear next to mine on the title page because everything has been brought together through our common industry. There is hardly a single clause written in it, while he lived, in which he did not have a part ...*
> (Banks to Clas Alströmer[1])

A number of manuscripts resulted from Banks's 1768–1771 voyage with Cook. The most important of these were by the Linnaean student Daniel Solander. Plant descriptions by Solander were much more detailed (Britten 1900–1905; Stearn 1984) and modern in form than those usually presented in the publications of the period. A catalogue of those Solander manuscripts held in British institutions has been published by Diment & Wheeler (1984). Solander's published plant names have been listed by Krok (1925). However, unpublished binomials coined by Solander have been adopted by a number of botanists who had access to the Banks Herbarium, which included Solander's manuscripts. A number appeared in the posthumous publication of Sydney Parkinson's (1773) *Journal of a voyage to the South Seas* over which there was so much acrimony between Banks and Stanfield Parkinson, the brother of Sydney Parkinson (see preface to that work; Merrill 1954; Beaglehole 1962; Willson 1961; Carr 1983). The majority of Solander's binomials appearing in this work are considered unpublished under nomenclatural rules as the descriptions are inadequate to recognize the plants. In those few cases where the descriptions are adequate, e.g. *Spondias dulcis*, *Pandanus tectorius*, *Sitodium altile* (now known as *Artocarpus altilis*) and *Anisum fagiferum* (now *Inocarpus fagifer*), there are other controversies about the author citation (St John 1972; Stone 1988). In none of them is Solander acknowledged in the author citation.

Another group of publications which were to involve Joseph Banks in controversy were those of the Forsters, father and son, who replaced Banks and Solander at the last moment as botanists on Cook's 1772–1775 second voyage. In 1776, the Forsters jointly produced *Characteres generum plantarum*, while the son, George Forster, published his *Prodromus* in 1786. They had access to Solander's manuscripts, Parkinson's drawings and the Banks herbarium on their return from the voyage and relied heavily on these, with little acknowledgement, for their publications. The pirating of Solander's names, at least with respect to Tahitian plants, is described by Merrill (1954) in his discussion of the botany of Cook's voyages. Allan (1961) rectified this in relation to New Zealand plants in the first volume of the latest edition of the *Flora of New Zealand*, judging by the many author citations in the form 'Solander ex ...'. The volume was dedicated 'to the memory of Daniel Carl Solander F.R.S.'

Other people to have access to the Banks Herbarium and Solander's manuscripts were European botanists such as Joseph Gaertner, the younger Linnaeus, Vahl, Willdenow, Lamarck and A. P. de Candolle, all of whom published names included in Solander's manuscript *Plantae Novae Hollandiae* or written on his specimens. While some were careful in crediting names to Solander, others were not (Table I).

The celebrated botanist Robert Brown used Solander's manuscripts extensively. Before his departure for Australia as botanist on Flinders's voyage, not only did he copy Solander's descriptions of Australian plants, he also formed an herbarium 'from the specimens brought by different collectors from Botany Bay — but chiefly from Sir Joseph's own collections' (Brown's diary, quoted in Mabberley 1985). While Brown published some names with acknowledgement to Solander, it is clear that there were a number published where he chose to take up Solander's epithet without any credit to him (Table I). In his treatment of the Proteaceae, discussed later, Brown (1810a) published Solander's description of *Knightia excelsa* of New Zealand. It was by far the longest in the work and was clearly attributed to Solander:

> For the figure here given I am also indebted to the liberality of the illustrious President of the Royal Society, who has enabled me to complete the account of this remarkable plant, by permitting me to copy Dr Solander's description, which I was the more desirous to give, as it exhibits a specimen of the accuracy with which subjects of natural history were investigated in that celebrated voyage; of whose important results it is to be lamented so little is known to foreign naturalists, though in this country they have ever been open to the public, and in the most advantageous manner.

Despite this, authorship has been attributed to Brown alone in subsequent literature, even by Solander's champion H. H. Allan (1961).

The principal author of *Flora australiensis*, George Bentham (1863–1878) was also guilty of using Solander's epithets without any tribute to the original author. However, with almost a century elapsed, the original authorship may have been obscure. According to his introduction to the *Flora*, Bentham consulted only a few of the specimens collected by Banks and Solander, and (Britten 1907) none of the associated plates, mainly confining himself in his visits to the British Museum to studying Brown's manuscript and herbarium, in which Banks and Solander's names occasionally appear.

The author citations of some of Solander's names in current literature (Table I) contain varying acknowledgement of Solander's contribution. Citations range from 'Solander' to 'Banks & Solander' to 'Banks' or, in many cases, to no reference at all to Solander or his sponsor. Individual species may be cited differently from text to text. Thus, *Philydrum lanuginosum* is referred to 'Gaertn.' in Diment *et al.* (1984), but 'Banks & Sol. ex Gaertn.' in Adams (1987).

Whether any credit should be given to Banks for the coining of these names is not clear. While he financed the scientific part of the voyage and participated in the collecting it is unlikely that he had the major role in the documentation of the flora. Solander was employed for this purpose and (Diment & Wheeler 1984) the manuscripts are his. Thus, any authorship mentioning

Table I

The current treatment of some names formulated by Solander in which the epithet used today remains unchanged, extracted from Diment *et al.* (1984)

*Name in Solander's manuscript	Currently accepted name and author citation used
Attributed to Solander	
Philadelphus squarrosus	*Leptospermum squarrosum* Sol. ex Gaertn.
Metrosideros viminalis	*Callistemon viminalis* (Sol. ex Gaertn.) G. Don
Metrosideros viridifolia	*Melaleuca viridifolia* Sol. ex Gaertn.
Metrosideros nodosa	*Melaleuca nodosa* (Sol. ex Gaertn.) Smith
Melaleuca suaveolens	*Tristania suaveolens* (Sol. ex Gaertn.) Smith
Pomax umbellata	*Pomax umbellata* (Gaertn.) Sol. ex A. Richard
Attributed to Banks and Solander	
Dillenia alata	*Dillenia alata* (R. Br. ex DC.) Banks & Sol. ex Martelli
Capparis lucida	*Capparis lucida* (Banks & Sol. ex DC.) Benth.
Polygala rhinanthoides	*Polygala rhinanthoides* Banks & Sol. ex Benth.
Octanthera secunda	*Comesperma secundum* Banks & Sol. ex DC.
Gauroides alulata	*Boronia alulata* Banks & Sol. ex Benth.
Utricularia albiflora	*Utricularia albiflora* Banks & Sol. ex R. Br.
Utricularia limosa	*Utricularia limosa* Banks & Sol. ex R. Br.
Attributed to Banks	
Capparis canescens	*Capparis canescens* Banks ex DC.
Attributed to neither Banks nor Solander	
Adelioides decumbens	*Hypserpa decumbens* (Benth.) Diels
Viola monopetala	*Hybanthus monopetalus* (Roemer & Schultes) Domin
Jambolifera alba	*Correa alba* Andrews
Crotalarioides frutieosa	*Lamprolobium fruticosum* Benth.
Glycine retusa	*Vandasia retusa* (Benth.) Domin
Glycine rubieunda	*Kennedia rubicunda* (Schneevoogt) Vent.
Dolichas giganteus	*Mucuna gigantea* (Willd.) DC.
Mimosa suaveolens	*Acacia suaveolens* (Smith) Willd.
Mimosa grandiflora	*Abarema grandiflora* (Benth.) Kostermans
Rhizophora gymnorrhiza	*Bruguiera gymnorrhiza* Lam.
Metrosideros citrinus	*Callistemon citrinus* (Curtis) Skeels
Melaleuca angustifolia	*Melaleuca angustifolia* Gaertn.
Lobelinum alsinoides	*Stylidium alsinoides* R. Br.[1]
Lobeliastrum pedunculatum	*Stylidium pedunculatum* R. Br.[1]
Lobelia filiformis	*Leschenaultia filiformis* R. Br.[2]
Lobelia rotundifolia	*Goodenia rotundifolia* R. Br.[2]
Laugerioides ruscifolia	*Leucopogon ruscifolia* R. Br.[1]
Asclepiadea nummularia	*Dischidia nummularia* R. Br.[1]
Exaeoides pygmaea	*Dischidia pygmaea* R. Br.
Exaeoides stellata	*Mitrasacme stellata* R. Br.[1]
Exacoides laricifolia	*Mitrasacme laricifolia* R. Br.[1]
Erinus tetragonus	*Buchnera tetragona* R. Br.[1]
Duplanthera tetraphylla	*Deplanchea tetraphylla* (R. Br.) F. Muell.
Ruellia angustifolia	*Hygrophila angustifolia* R. Br.[1]
Dianthera juncea	*Justicia juncea* R. Br.[2]
Callicarpa pedunculata	*Callicarpa pedunculata* R. Br.[2]
Ocymum foetidum	*Plectranthus foetidum* Benth.
Cunila fruticosa	*Westringia fruticosa* (Willd.) Druce
Pharnacioides arborescens	*Deeringia arborescens* (R. Br.) Druce[1]
Laurus glauca	*Endiandra glauca* R. Br.[1]
Leucadendroides glauca	*Grevillea glauca* J. Knight
Leucadendrum ericaefolium	*Banksia ericifolia* L.f.
Leueadendrum integrifolium	*Banksia integrifolia* L.f.
Leucadendrum dentatum	*Banksia dentata* L.f.
Taxoides latifolia	*Exocarpos latifolius* R. Br.[2]
Urtiea argentea	*Pipturus argenteus* (G. Forster) Weddel
Epidendrum canalieulatum	*Dendrobium canaliculatum* R. Br.[1]
Epidendrum rigidum	*Dendrobium rigidum* R. Br.[1]
Anthenicum eaeruleum	*Dianella caeruleum* Sims
Philydrum lanuginosum	*Philydrum lanuginosum* Gaertn.
Xyris paludosa	*Xyris paludosa* R. Br.[1]
Pomax umbellata	*Pomax umbellata* (Gaertn.) Sol. ex A. Richard

* Names of those genera ending in '*oides*' were used by Solander merely to indicate relationships with the genus forming the stem of the name (Stearn 1966).

1 Banks and Solander's specimen(s) cited by Brown (1810b) in his *Prodromus.*

2 Banks and Solander's specimens not cited by Brown in his *Prodromus.*

only Banks is likely to be erroneous. Furthermore, the citation of Banks as the first author when the two are attributed joint authorship, dating as it does from the time of Banks's great influence on British botany, may reflect his social status rather than any true claim to it. Indeed, 20 years after his death Banks was described in the *Florists journal* of 1840 (Desmond 1982) as a man 'having no pretensions to profound knowledge himself, but excellent taet in finding out and great liberality in rewarding those who had'. It is surely a debatable point as to whether his two Swedish recruits would today consider that they had been so liberally rewarded.

Despite this, it would be unwise to deny Banks any contribution to the results of Cook's voyage. Britten (1905) has given a contrasting view of Banks as a botanist in his introduction to three volumes of plates with descriptions of Australian plants collected by Banks and Solander (Britten 1900–1905):

> It will be observed that the names of species which have been adopted by various authors from Solander's MSS. are throughout the present work attributed to Banks and Solander, although in many instances Solander alone was originally quoted for them. A careful study of the various memoranda and MSS. preserved in the Department of Botany [British Museum] makes it clear that Banks, who had come to be regarded as a patron of science rather than as a man of scientific attainments, had much more botanical knowledge than was at one time supposed. This seems to have been recognized by his contemporaries; thus Smith [*Rees cyclopaedia* (1819), under *Jasminum*] speaks of what are generally called the Solander MSS. as the work of Banks and Solander, and Patrick Russell [in preface (1794), p. viii] says that the catalogue of plants in the second edition of the Natural History of Aleppo was drawn up by Banks and Solander, although it has been customary to attribute the new species to Solander only.

Solander worked in the period when scientific publication was in its infancy, just before the newly formed scientific societies produced journals. He would have required special financial support to publish his work separately from Banks. In any case, having been sponsored by Banks, he would almost certainly have been obliged to publish his work jointly with him. Claims that laziness and dissipation were the reasons for Solander's failure to publish are hardly to be countenanced, for he produced numerous manuscripts and had prepared for publication all his descriptions but for those of Australian plants (Britten 1905; Marshall 1984).

Further manuscripts from Cook's voyages

On Cook's third voyage (1776–1780) William Anderson the surgeon and David Nelson the midshipman and gardener collected plants. Anderson had been the assistant surgeon on Cook's previous voyage of 1772–1775 and assisted the Forsters in their collecting (Brosse 1983). Both he and Nelson were commemorated in generic names by Robert Brown. In dedicating *Nelsonia* (Acanthaceae) in honour of David Nelson, Brown (1810b) paid tribute to the large number of new species found by Nelson on this voyage.

Manuscripts by William Anderson are mentioned by Brown (l.c.) in his partial dedication[2] to him of the genus *Andersonia* (Epacridaceae). These manuscripts, found by Brown amongst the Banks Papers ('*tom.* 2, p. 32; *et tom.* 3, p. 184'), must have been produced before 1778, the year in which Anderson died during Cook's third voyage (Brosse 1983). From them Brown cited four Australian genera which had been recognized by Anderson: *Collema* by then published as *Goodenia* Smith in 1794, *Euphocarpus* published as *Correa* Andrews in 1798, *Ramsaia* published as *Bauera* Banks ex Andrews in 1801, and *Aromadendrum* published as *Eucalyptus* L'Herit. in 1789.

One of Anderson's other generic names, *Pringlea*, was taken up much later by J. D. Hooker (1844–1847) in his *Flora antarctica* when he named the antiscorbutic 'Kerguelen-Land Cabbage'. Hooker credited Anderson with its authorship.

B. Early publications involving Australian plants and their authorship

Illustrated magazines

A number of Australian plants first appeared in illustrated botanical magazines. These began in 1787 with the journal popularly known as *Curtis's botanical magazine* after its first editor William Curtis. It employed artists, chief of whom initially was Sydenham Edwards. The success of *The botanical magazine* prompted a number of rival publications. Unlike their predecessor, these often took the name of the artist rather than the author of the descriptions.

Actual authorship of the descriptions of new plants which occur in these magazines can be obscure. John Lindley and John Ker-Gawler (also known as John Bellenden Ker and other variations) were responsible for the descriptions in Sydenham Edwards's *The botanical register* (1815–1847). Nowadays authorship of names in the early volumes is invariably assigned to one or other of them. However, in the first 14 volumes, edited by Ker-Gawler (Stafleu & Cowan 1976–1988), Ker-Gawler's name does not appear anywhere. Fortunately Lindley concluded his contributions with 'J.L.', even before his name first appeared on the title page in volume 15 of the series. Authorship in the artist William Hooker's *The paradisus londinensis* (1805–1808) was often attributed to Hooker in contemporary works, despite Richard Salisbury being responsible for the descriptions. Salisbury's name did not appear on the initial title page. It did appear on the reprint in 1806 and all subsequent issues (Stafleu & Cowan 1976–1988). Today authorship of names is correctly attributed to Salisbury.

The treatment of authorship in Henry Andrews's *The botanist's repository* (1797–1815) is quite different, as discussed by Britten (1916b). The title page states that the whole had been executed by Andrews (Fig. 1). Despite this statement, Andrews (1805) himself admitted in the preface to a later work on geraniums, in which he also claimed sole authorship, that 'in the descriptions of the first five volumes of his *Botanists' repository* he was assisted by gardeners and cultivators; and in the sixth and last volume by a botanist whose opinions were diametrically opposite to those of the former'. Thus Andrews admitted what was already known amongst the botanical community, that John Kennedy, Andrews's father-in-law and co-proprietor of the famed Lee & Kennedy nursery (see later), was responsible for the descriptions in the first five volumes. Those of the sixth volume were produced by Haworth, who was possibly also involved with George Jackson in the seventh. The later volumes were edited by George Jackson. Unlike the other magazines mentioned, authorship continues to be attributed to this day to Andrews, such as in *Correa alba* Andrews, *Parahebe derwentiana* (Andrews) Briggs & Ehrendorfer.

Hortus kewensis, *a garden list*

It is already well documented that *Hortus kewensis*, a catalogue of the Kew collection published by William Aiton in 1789, was not his work alone (e.g. Britten 1912; Stafleu & Cowan 1976). Both Solander and Dryander contributed considerably to this work, and many of their new species were published in it. Yet nowhere within the publication is there any acknowledgement of Solander or Dryander. This injustice was compounded when William Aiton's son, W. T. Aiton, produced a second edition in 1810 to 1813, this time with the help of Dryander and Robert Brown. Again acknowledgement is lacking from these volumes until the final postscript of volume 5 in 1813 when W. T. Aiton partially redressed the omission in paying tribute to his deceased friend Jonas Dryander who:

> exerted his best talents not only in improving the plan, but in arranging the material of the Catalogue for the press, and correcting the proof sheets during the progress to the printing.

To Robert Brown he:

> attributed the improved state of the latter volumes of this work. Much new matter has been added by this gentleman, and some without reference to his name; but the greater part of his able improvements are distinguished by the signature of Brown mss.

Why Brown should have been afforded recognition in author citations while Solander and Dryander were not is unexplained. The two Swedish botanists contributed many of the names (Krok 1925). Further examples of lack of acknowledgement of their recognition and naming of taxa are given later.

At a somewhat later date, John Ker-Gawler (1823) was extremely seathing of the Aitons when he referred to *Hortus kewensis* as a 'monument of the taste and criticism of Solander and Dryander, the worthy disciples of Linnaeus, and the most accomplished scholars of their age', even though:

> in the very title page we see them robbed of the reward of their erudition (and we know they received no other) to give immortality and renown to vulgar ignorance, the

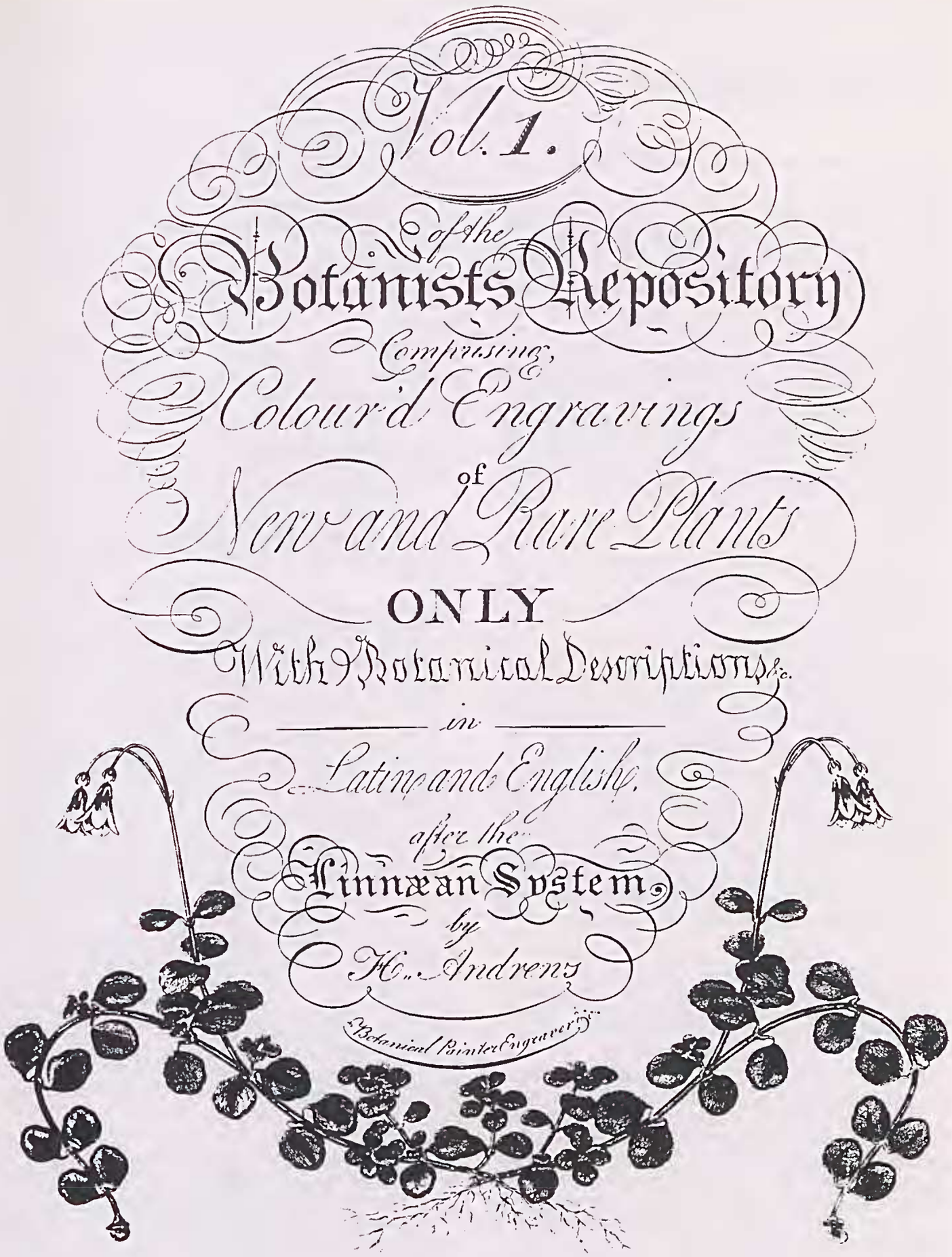


Fig. 1. The engraved title-page of the first volume of Andrews's *Botanists repository*, in which all credit is taken by the artist.

names of native dunces being suffered to usurp the place belonging to those of the genius and talent of another land.

For a more complete history of *Hortus kewensis* and a consideration of authorship of the plant names see Britten (1912).

Richard Salisbury's Prodromus *and* Paradisus londinensis

One of the garden lists of the day was Richard Salisbury's (1796) *Prodromus stirpium in horto ad Chapel Allerton vigentium*. It comprised brief descriptive accounts of the plants he had in cultivation at Chapel Allerton. Many of the names published in it had priority over later names for the same plant but were ignored by the scientists of the day. This was rectified over a century later by Britten (1916a). It is likely that Salisbury was not the sole formulator of names in this work as has previously been thought, although the extent to which others were involved is not clear.

There is some evidence that James Lee, joint founder of the Lee & Kennedy nursery, one of the eminent nurseries of the day, provided some names to Salisbury. Under Proteaceae (p. 48) the form of the entry in a number of cases is:

> PROTEA
> Anemonefolia 1. P. foliis 2-pinnatifidus: laciniis 2–3-jugis, linearibus, scabriusculis, pubescentulis, supra canaliculatis.
> Ex Port Jackson auct. Jac. Lee.

'Jac. Lee' refers to James Lee. Lee was a friend of Banks. He was a frequent visitor to the Banks Herbarium, where he would undoubtedly have had contact with Solander and then Dryander. He recommended the artist Sydney Parkinson, a fellow Quaker and Scotsman, to Banks and also David Nelson, the gardener on Cook's third voyage. The Lee & Kennedy nursery was the recipient of many of the first seeds sent from Australia, and for some time it specialized in supplying New Holland plants (Willson 1961). Furthermore, Lee was acquainted with the binomial and the Linnaean system. He corresponded with Linnaeus and was responsible for the first English translations of Linnaean ideas. The title of this work (Lee 1760) was:

> An introduction to botany containing an explanation of the theory of that science and an interpretation of its technical terms extracted from the works of Dr Linnaeus and calculated to assist such as may be desirous of studying that author's method and improvements.

There were ten editions, the last appearing in 1810, well after Lee's death in 1795.

What does Salisbury mean by 'auct. Jac. Lee'? The meaning of the Latin *auctor* presents a number of possibilities; it could be that authorship is being attributed to Lee by Salisbury, or it could be that the seeds or plants were given to Salisbury by Lee, or possibly just the information that they came from Port Jackson is being attributed to Lee.

Reference to his later work *The paradisus londinensis* (Salisbury 1805–1808), in which Salisbury commonly uses the apparently synonymous English phrase 'communicated by Messrs Lee and Kennedy', shows that Salisbury did use names supplied by Lee and Kennedy without acknowledgement. In its volumes Salisbury published much of his original work and his arguments for natural classification. Under species number 24, *Protea mucronifolia*, we find the following statement:

> This new Proteaceae was communicated by Mess. Lee and Kennedy; in a natural series, which is the grand object that all true Botanists keep in sight, whether species or genera are to be determined, it must be placed near *P. acuifolia*. ... The author of the Exotic Botany [J. E. Smith] having sent an oblique shot against the ***very appropriate name given to that species by the distinguished collectors*** above mentioned I might leave them to defend it: ... but as in my opinion he attempts to mislead the taste of the public I shall very willingly say a few words to vindicate ***their appellation***. [Our highlighting]

Protea acuifolia had been published earlier as species number 2 in the same *Paradisus londinensis* series; its name has always been attributed to Salisbury. Under it there was no mention of Lee and Kennedy supplying the name:

> it was communicated by Messrs Lee and Kennedy, whose liberality in giving specimens of their rarest plants to Botanists does them credit.

A second example of Lee and Kennedy supplying the name is to be found under species number 11, *Protea glaucophylla*, in the same work where the text reads as follows:

> Though so different in the leaves, this shrub ... was likewise communicated by Messrs Lee and Kennedy. As it always has a stem, though a very short one, ***I very willingly adopt their name*** [Our highlighting].

The plant had previously been known as *Protea acaulis*.

Thus Lee and Kennedy did provide names. By 'communicated' and the earlier 'auct.' Salisbury apparently meant in some, if not all, instances not just giving specimens, but the provision also of information which, at least in the cited cases, included the provenance and the name. As nurserymen, Lee and Kennedy would presumably have had to provide names when distributing their New Holland plants. Reference has already been made to Kennedy's contribution of names to Andrews's *The botanist's repository*. Whether Lee provided names in the case of Salisbury's (1796) *Prodromus* we shall probably never be certain. The names involved are simple (Table II). They invariably refer to the leaves and could well have been coined by a nurseryman where only vegetative material was available. It remains to be investigated how often the phrase 'communicated by Messrs Lee and Kennedy' in *The paradisus londinensis* indicates that the nurserymen provided the plant name.

Joseph Knight's controversial work on the Proteaceae

Richard Salisbury was further involved in controversy in the publication of a work on Proteaceae which has for almost two centuries been claimed to be a plagiarism of the work of Robert Brown. Robert Brown noted in his diary on 9 November 1808 (Mabberley 1985) that Dryander had begun the new edition of *Hortus kewensis* and that he wished Brown to publish on Proteaceae so that he might use the new genera. In response to this request Brown prepared and read to the

Table II
Names in Australian Proteaceae published in R.A. Salisbury's (1796) *Prodromus Chapel Allerton* which are possibly attributable to James Lee

Name in Salisbury (1796)	Current name and author citation
Protea anemonefolia	*Isopogon anemonefolius* (Salisb.) Knight
Protea anethifolia	*Isopogon anethifolia* (Salisb.) Knight
Protea fucifolia	*Petrophile fucifolia* (Salisb.) Knight
Banksia tenuifolia	*Hakea sericea* Schrad. & J. Wendl. (*non Hakea tenuifolia* Dum. Cours.)
Banksia pinifolia	Illegitimate as *Banksia gibbosa* Smith cited as synonym
Banksia teretifolia	*Hakea teretifolia* (Salisb.) Britten
Banksia oleaefolia	*Hakea dactyloides* (Gaertner) Cav. (non *Hakea oleifolia* (Smith) R. Br.)
Banksia serratifolia	Illegitimate as *Banksia serrata* L.f. cited as synonym
Banksia asplenifolia	*Nomen dubium* (George 1981a); neotypification would have preserved this name, in use in New South Wales before 1981 for what is now known by the later name *Banksia oblongifolia* Cav.
Banksia phylicaefolia	Illegitimate as *Banksia ericifolia* L.f. cited as synonym

Linnean Society his paper 'On the natural order of plants called Proteaceae' on four separate dates between 17 January 1809 and the 7 March 1809. This work was not published until 8 March 1810.

In the time between Brown's lectures and the publication there appeared a work written by Joseph Knight (1809) *On the cultivation of the plants belonging to the natural order of Proteeae, with their generic as well as specific characters and places where they grow wild.* Knight was gardener to George Hibbert MP, who was famous for his collection of Proteaceae, one of the largest ever assembled (Rourke 1980). When Hibbert lost interest in this collection it was given to Knight and it formed the basis of Knight's nursery business established in 1809 (Britten 1886b; Hadfield *et al.* 1980), later to become the famous Veitch's nursery (Fletcher 1969). Salisbury had obviously been on good terms with Hibbert and Knight, as many of the plants he featured in *The paradisus londinensis* had been obtained from Hibbert.

The title page of Knight's work refers only to Knight as the author and in the preface he claims that 'perhaps few works have greater claims to originality than the present, not a single line copied from any other.' However, he does say before this that to have ascertained so many generic and specific differences would have been quite impossible,

> if fortunately his labours, like those of the late Mr Aiton respecting the Hortus Kewensis, had not been thought worthy the assistance of men more learned than himself.

That the more learned help was given by Salisbury seems obvious. Within the preface Knight advocated a natural system of classification and a change of specific epithets 'when the old ones were manifestly absurd', both views held by Salisbury and setting him at odds with the establishment of the day (Britten 1886b). Knight further acknowledged R. A. Salisbury 'whose manuscripts have been found so useful in every sheet'. While much of the commentary in the work can be attributed to Knight with his specialist horticultural knowledge of the Proteaceae, Salisbury was almost certainly responsible for the generic delimitation, the short Latin descriptions and the synonymy. It may be significant that the layout is almost identical to that in his *Prodromus Chapel Allerton.*

Furthermore, in a copy of Brown's (1810b) *Prodromus florae Novae Hollandiae* extensively annotated by Salisbury (see next chapter), Salisbury has not challenged Brown's citation of authorship of Knight's work and the names therein as 'Knight & Salisb.'. Salisbury also has not commented upon Brown's assertion that discrepancies in the circumscription of the genus *Grevillea* could have arisen through a misreading of Brown's (1810a) treatise in the Linnean Society transactions (presumably in proof or manuscript form) or through Salisbury misunderstanding his lectures on the topic to the Society. This lack of comment by Salisbury suggests that he accepted Brown's view of the authorship of Knight's work; elsewhere in the volume he has often indicated his disagreement with Brown. Taking all this into account it is suggested that the authorship of the new taxa in Knight's *Proteeae* should be cited as 'Knight & Salisbury'.

In Knight and Salisbury's publication Robert Brown is credited with the authorship of a number of genera (Table III). However, other new genera described by 'Knight & Salisbury' were said to have been plagiarized from those presented by Brown to the Linnean Society; Salisbury had been present at the meetings when Brown read his paper. In his work on the Proteaceae, Brown (1810a) recognized the priority of Salisbury's names of South African genera in *The paradisus londinensis* (Salisbury 1807). In the preface to this paper, Brown stated:

> the genera into which I have subdivided the great African family Protea, are in most cases similar to those already proposed by Mr Salisbury in the Paradisus Londinensis: from that essay they are certainly not derived but before its publication were formed and submitted to the judgement of Mr Dryander .... As Mr Salisbury's generic names have the unquestionable right of priority of publication, I have in most cases adopted them, though I wish some of them had been differently constructed.

This statement referred only to the African genera. No mention was made throughout Brown's paper of Knight and Salisbury's work, possibly because Brown had not seen it before his own manuscript was finalized. Consequently, Brown provided his own names for Knight and Salisbury's Australian genera in this first essay on the Proteaceae.

By contrast, in his second treatise of the Australian Proteaceae published shortly afterwards in the *Prodromus*, Brown (1810b) cited Knight & Salisbury's work. Where generic names were attributed to him he adopted them, but he placed all Knight and Salisbury's genera into synonymy under his own later ones. This

Table III
Treatment of Salisbury's genera of Proteaceae by Robert Brown (1809) in his monograph on the family

Salisbury's genera	*Brown's name (current name, if differs)
The early genera (Salisbury 1807)	
Australian genera	
Atylus Salisb.	*Petrophila* [sic] R. Br.[1]
Atylus Salisb.	*Isopogon* R. Br.[1]
South African genera	
Mimetes Salisb.	*Mimetes* Salisb.
Paranomus Salisb.	*Nivenia* R. Br. (= *Paranomus* Salisb.)
Spatalla Salisb.	*Spatalla* Salisb.
Genera published in Knight (1809)	
Australian genera	
Stylurus Salisb.	*Grevillea* R. Br.
Lysanthe Salisb.	*Grevillea* R. Br.
Grevillia R. Br. (conserved with the spelling *Grevillea*)	*Grevillea* R. Br.
Tricondylus Salisb.	*Lomatia* R. Br. (conserved name)
Cybele Salisb.	*Stenocarpus* R. Br. (conserved name)
Hylogyne Salisb.	*Telopea* R. Br. (conserved name)
Josephia R. Br.	*Dryandra* R. Br. (conserved name)
Isopogon R. Br.	*Isopogon* R. Br. (conserved name)[1]
Petrophile R. Br.	*Petrophila* [sic] R. Br.[1]
Rymandra Salisb.	*Knightia* R. Br. (conserved name)[2]
South African genera	
Soranthe Salisb.	*Sorocephalus* R. Br. (conserved name)
Gissonia Salisb.	*Leucadendron* R. Br. (conserved name)
Euryspermum Salisb.	*Leucadendron* R. Br. (conserved name)
Chasme Salisb.	*Leucadendron* R. Br. (conserved name)
Erodendrum Salisb.	*Protea* L. (conserved name)[3]
Pleuranthe Salisb.	*Protea* L. (conserved name)[3]
Diastella Salisb.	*Leucospermum* R. Br. (conserved name)
Leucadendrum L.	*Leucospermum* R. Br. (conserved name)
Tropical American genera	
Euplassa Salisb.	(not treated by Brown; accepted today)
Panopsis Salisb.	(not treated by Brown; accepted today)

*Those genera of Brown's which have been taken up by the legal procedure of conservation over the earlier Salisbury names (see text) are indicated. Five of Salisbury's names, attributed to South African and American genera, were not overturned by Brown.

1 *Atylus* Salisb. included two named species, *Protea fucifolia* Salisb. and *Protea anemonefolia* Salisb., which are respectively types of the genera *Petrophile* and *Isopogon*. Only the latter genus was conserved against the earlier published *Atylus*. *Atylus* has priority over *Petrophile*, unless *Protea anemonefolia* is chosen as lectotype of *Atylus* or *Petrophile* is conserved over *Atylus*.

2 Brown's genus *Knightia* was not named after Joseph Knight, but after Thomas Knight, a plant physiologist and associate of Banks.

3 *Protea* predates Salisbury's synonyms; it has been conserved against the name *Leucadendrum*, a name which Linnaeus originally applied to a *Protea* under present concepts, but which by conservation is now applied to a different genus as circumscribed by Brown.

conformed with J. E. Smith's attitude to the *Proteeae*, reflected in his letter to Brown in January 1810 (Mabberley 1985, p. 156):

> I have indeed got the Proteeae, but shall not keep it — I mean hereafter not to notice it or any other of the author's productions.

Unfortunately the generic names given by Knight and Salisbury seem never to have been used except in synonymy. Brown's later published names have now been conserved for all time over Salisbury's. This probably occurred in 1905 in the early days of generic conservation when justification was not required (Stafleu 1956), but it undoubtedly resulted from long-standing usage of Brown's names, despite attempts by James Britten (1886b) to rectify this injustice.

What is often overlooked is that Salisbury's interest in Proteaceae predated that of Brown. He had after all grown Proteaceae, and described a number in 1796 in his *Prodromus* and more in the series *The paradisus londinensis* from 1805, recognizing many new species and proposing (Salisbury 1807) a new generic treatment for South African Proteaceae. There were obviously sufficient Proteaceae growing in Hibbert's garden for Salisbury to independently distinguish the Australian genera. He did in any case attribute some of the genera to Robert Brown (Table III); no doubt these were the ones he had heard about in Brown's lectures (or perhaps before from Dryander: see later) and had not distinguished himself.

It seems a pity that the contribution made by Salisbury is not more justly represented in the Australian flora. Salisbury had a broad knowledge of Australian plants through cultivation and herbarium study and was initially an active member of the scientific establishment and a friend of J. E. Smith, the influential purchaser of the Linnaean Herbarium. When his personal life came under scrutiny, his reputation as a gentleman suffered (Dawson 1958; Mabberley 1985). At the same time, in opposition to an enshrined Linnaean system (Stafleu 1971), he was advocating a natural system of classification, again well before Brown came on the scene. He was also upsetting his fellow scientists (Fletcher 1969, p. 35), notably J. E. Smith, in changing botanical names when he did not find them appropriate[3] (see many examples in Salisbury 1805–1808).

The claims of plagiarism in the *Proteeae* were possibly the final straw which led to Salisbury's withdrawal to horticultural rather than scientific pursuits. He remained active in the Royal Horticultural Society in which he played an important role. He was a founding member in 1804 and was its Honorary Secretary from 1805 to 1814. His resignation as secretary, soon after being awarded the Society's Gold Medal, resulted from claims that his assistant was derelict in his duty (Fletcher 1969).

To what extent was the lack of acceptance of Salisbury's scientific work in his lifetime influenced by problems with his personality rather than objective scientific judgement on the part of his colleagues? The subsequent failure to take up Salisbury's names or recognize his contribution to botanical classification appears to be a direct result of his ostracism.

Robert Brown's Prodromus, *an uncompleted Australian Flora*

> *I can never sufficiently express my admiration of Brown's Prodromus — it is so exceedingly accurate. It is to me a source of astonishment how he saw so many of our rarer plants. I wish he had completed it.* (Ronald Gunn[4])

The third and last of Banks's botanist-librarians,

ribus, obtectis. *Corolla* tubulosa, subbilabiata. *Stamina* didynama, inclusa: *Antherarum* lobis divaricatis. *Stigma* emarginatum. *Capsula* calyce (ut plurimùm aucto) inclusa, bilocularis, bivalvis, valvis bipartitis; dissepimento parallelo, libero; placentis adnatis.

Herbæ *oppositifoliæ*. Flores *axillares, pedunculis bibracteatis.*

Obs. Hujus loci esse videtur Lindernia dianthera *Sw.*, caret autem bracteis, quæ in Herpestidis *Gært.* icone etiam desunt.

1. H. *floribunda*, glabra erecta, foliis lineari-lanceolatis, calycibus fructiferis reticulatis subcordatis, pedunculis sub apice bibracteatis. (T.) *v. v.*

Dr. with a L. jamnudum anno 1792.

LIMNOPHILA.

Calyx tubulosus, 5-fidus, æqualis. *Corolla* infundibuliformis, limbo 5-fido, subæquali. *Stamina* didynama, inclusa: *Antheræ* per paria cohærentes. *Stigma* dilatatum, obliquum. *Capsula* bilocularis, bivalvis, valvis bipartitis, dissepimento marginibus tardiùs dehiscentibus valvularum inserto.

Herbæ *oppositifoliæ, paludosæ*. Folia *profundè incisa, sæpè 3-partita, et hinc quasi verticillata.* Pedunculi *axillares, apice bibracteati.*

L. *gratioloides*. (T.) *v. v.*

Hottonia indica. *L.*

Obs. Plures forsan species sub hoc nomine confusæ sunt, in recenti statu tantummodo extricandæ.

ADENOSMA.

Calyx 5-partitus, laciniâ suprema majore. *Corolla* ringens, labio superiore indiviso, inferiore trilobo, æquali. *Stamina* didynama: *Antheris* approximatis. *Stigma* dilatatum. *Capsula* ovata, rostrata, bipartibilis: *Placentæ* suturis adnatæ.

Herba *annua, pubescens, glandulis conspersa, odore* Menthæ, *siccata nigricans.* Spica *foliata; v. flores axillares.* Calyx *bibracteatus, pilis articulatis hirsutus.* Corolla *cærulea.*

Oryzeæ - Obs. Huic genus proximum constituunt Ruellia uliginosa et balsamea: I place this & Adenosma with Thunia & Coccinia in the Order of Nelsoniæ.

Fig. 2. Extract from Richard Salisbury's copy of Robert Brown's *Prodromus florae Novae Hollandiae*, p. 442, showing Salisbury's reference to *Limnophila* being a Dryander name, formulated well before Brown arrived on the botanical scene. The annotation reads 'Dr. with an L. jamnudum anno 1792', indicating that Dryander spelt the name '*Limnophile*'.

Robert Brown, produced only one of the two volumes of his incomplete masterpiece, his *Prodromus florae Novae Hollandiae* (Brown 1810b; Fig. 2), in which he documented concisely in a natural system a large portion of the Australian plants known to that time. A complete explanation as to why Brown did not publish the second volume will probably never be given. References (Britten 1907; Stearn 1960; Mabberley 1985) cite his mortification at the lack of public interest in purchasing copies; out of 250 published, a number were given away (apparently not to Salisbury: Britten 1907) and only 26 were sold before he finally apparently withdrew those outstanding from sale in 1816, using the remainder as gifts. Suggestions that the Latin text was grammatically poor have been scotched (Britten l.c.; Mabberley l.c). Britten (1907) considered that a decline in interest in natural history works by 1817 may explain the lack of sales. More likely reasons may lie in a difficulty in understanding and using a natural system compared with an artificial one, the lack of an index, and its production in Latin giving it a scholarly rather than popular aura (Mabberley 1985). It did not conform with the popular works of the day with their emphasis on lavish illustration rather than the English text. Mabberley (l.c.) states:

> On the face of it, the 'fragment' is singularly unattractive, being a small, unfinished, unillustrated, unindexed, and indeed expensive volume in Latin, on bad paper, and poorly printed by the standards of the day.

Brown had to go into this venture with his own finances under his agreement with the Admiralty and was still apparently preparing the remainder for publication in 1816 (Mabberley 1985). Did Banks offer financial support for the completion of the work? Initially Banks had favoured the simultaneous inclusion of Ferdinand Bauer's illustrations with Brown's text. In 1806 he wrote to William Marsden of the Admiralty (reproduced in Edwards 1981a):

> Brown and Bauer should join together in publishing engravings of the most interesting objects of natural history they have collected, in a handsome form, as a periodical work, there being every reason to hope such a work will, if conducted with prudence and economy be a source of profit to these gentlemen.

Despite Banks's predictions, the 15 plates of Bauer's paintings which appeared as *Illustrationes florae Novae Hollandiae* (Bauer 1806–1813) did not sell well. Edwards (1981a) suggested that this might have arisen from the glut of such illustrative works being produced at the time and a general lack of money because of the Napoleonic wars. Soon after the publication of the *Prodromus* in 1810, Brown indicated in a letter that he still anticipated producing a Flora of New Holland (Mabberley 1985, p. 174). Yet only two weeks later he wrote (Mabberley l.c.):

> I have at present very little hope of being able to accomplish it [the Flora] as I could wish, or indeed in any manner for with respect to it there seems to be such a freezing indifference in a quarter where I hardly expected it [? Banks] as makes me think that very little is looked for from me in such an undertaking & admonishes me also of how little importance what I have already attempted is considered. My Book indeed may be truly said to be still born nor have I heard of more than one or two people were at all desirous of possessing it. [Mabberley's comment].

Within a matter of weeks Dryander died. Brown was employed by Banks as his replacement. If Banks was indeed indifferent to Brown's New Holland work, it is scarcely surprising that the second part of the *Prodromus* never appeared. At least in producing the compact *Prodromus* Brown avoided a repetition of the fate of Solander's manuscripts as well as operating within his own financial constraints. Were openings available for him to publish elsewhere, such as in serial form in the Linnean Society's transactions? Were attempts made to help or persuade him to do so, in the same way as Dryander had encouraged the publication on the Proteaceae (see above) on account of their great horticultural importance? One avenue of publication which Brown did take up was to publish a number of new genera and families in an appendix to Flinders's account of his voyage to Terra Australis (Brown 1814).

With his failure to publish his second volume, Brown lost credit for recognizing many new plants. We have not fully investigated the extent to which Brown's manuscript names have been used although there is an indication in Mabberley (1981) that J. J. Bennett may have compiled this information. Brown's manuscript may not have been as freely available as for example Solander's. Certainly there was a long delay until after the late 1870s before his herbarium was distributed and access was not given freely to his collections, in contrast to the ready accessibility of the Banks collections (Edwards 1981a). However, a few of Brown's names were taken up by others with acknowledgement in the mid 1800s, for example *Eucalyptus perfoliata* R. Br. ex Benth., *Drosera banksii* R. Br. ex DC., *Capparis lasiantha* R. Br. ex DC. and *C. lucida* (DC.) R. Br. ex Benth.

The degree of originality of Brown's Prodromus

Numerous handwritten annotations in a copy of Brown's *Prodromus* in the library of the Botanic Gardens of Adelaide have been recently found by us to be those of Richard Salisbury (Fig. 2). Many of these indicate inadequate acknowledgement by Brown of the contributions of others to his *Prodromus*.

The discovery of Salisbury's volume sheds light on the role played by others, particularly Dryander, in the recognition of taxa and the supply of names. Whether Salisbury's comments derived from personal communication or unpublished manuscripts or both warrants investigation. Salisbury's care in attributing names to the correct author, acknowledged by Britten (1916b), is evident here also. One inconsistency noted, however, is in the authorship of the genus *Grevillea*; Knight and Salisbury attributed it to Brown in their work on Proteaceae (Knight 1809), but Salisbury annotated his copy of the *Prodromus* with 'Dr.' for Dryander.[5] That Dryander made a contribution to the delimitation of the genera of the Proteaceae is admitted by Brown (1809) in his treatment of the family; in a reference (p. 45) to use of the Banks Herbarium he acknowledged:

> consulting my friend Mr. Dryander, both as to the formation of genera and respecting synonyms, on which points his sound judgement and unrivalled erudition so well enable him to decide.

The British Museum (Natural History) has manuscripts of Solander, Dryander and Salisbury which

Table IV

Some generic, sectional or species group names in Robert Brown's (1810b) *Prodromus florae Novae Hollandiae* for which the authorship is disputed and sometimes an alternative name provided by R. A. Salisbury, according to annotations on his apparently personal copy of the work held in the library of The Botanic Gardens of Adelaide.

Published text			*Annotation by Salisbury
Page no.	Genus name	Authorship	
Names attributed by Salisbury to Dryander in unmodified form			
149	*Allantodia*	[R. Br.]	'Dr.'
225	*Glossodia*	[R. Br.]	'Dr.'
235	*Oreobolus*	[R. Br.]	'Dr.'
239	*Evandra*	[R. Br.]	'Dr.'
263	*Calectasia*	[R. Br.]	'Dr.'
278	*Trieoryne*	[R. Br.]	'MS.' [Dr. has been erased] '[T.] Elatior flowered at Chapel Allerton in 1799'
287	*Johnsonia*	[R. Br.]	'Dr.'
330	*Dipodium*	[R. Br.]	'Dr.'
375	*Grevillea*	[R. Br.]	'Dr.'
412	*Decringia*	[R. Br.]	'Dr.'
442	*Limnophila*	[R. Br.]	'Dr. with an E. jamdudum anno 1792' [i.e. *Limnophile* Dr.]
448	*Duboisia*	[R. Br.]	'Dr.'
480	*Nelsonia*	[R. Br.]	'So named by Dryander long before Brown even eame to London who pointed out to me the seeds without retinacula'
507	*Chilodia*	[R. Br.]	'Dr.'
541	*Leucopogon*	[R. Br.]	'Dr.'
552	*Lysinema*	[R. Br.]	'Dr. ob filamenta a corolla plus minus libera'
553	*Cosmelia*	[R. Br.]	'Dr.'
—	*Vellcia*:		
580	1. *Menoceras*	[R. Br.]	'Dr.'
Names of derivation similar to those used by Robert Brown and attributed by Salisbury to himself, Dryander or Solander			
229	*Arthrostylis*	[R. Br.]	'*Arthrogyne* Dr. ob euphonium'
232	*Chaetospora*	[R. Br.]	'*Chactais* Dr. Sr.'
301	*Anigozanthos*	Labill.	'*Anigosia* [metius]'
301	*Phlebocarya*	[R. Br.]	'*Phlebidium* MSS'
320	*Mierotis*	[R. Br.]	'*Microphylax* MSS. *Microtoa* jam apud Swartz'
322	*Cyrtostylis*	[R. Br.]	'*Cyrtosia* MSS.'
325	*Lypcranthus*	[R. Br.]	'[inelusus] *Lypcria* dixit Dryander [i.e. name derived from Dryander's eomments]'
329	*Caleana*	[R. Br.]	'*Calcya* MSS.'
—	*Grevillea*:		
379	I.D. . . . *Plagiopoda*	[R. Br.]	'*Plagiopus*'
410	*Anisacantha*	[R. Br.]	'*Anisacline* Dr.'
503	*Anisomeles*	[R. Br.]	'*Anisandra* Dr.'
539	*Cyathodes*	Labill.	'*Cyathissa* MSS.'
548	*Troehoearpa*	[R. Br.]	'*Trochidium* MSS.'
552	*Prionotes*	[R. Br.]	'*Prioganum* MS.'
Names of derivation different from Robert Brown's and attributed by Salisbury to himself, Dryander, Solander, and others			
—	*Asplenium*:		
150	OBS.III. . . . *Aspidium fontanum . . . Aspidium filix feminae . . .*	—	'*Thelypteris* MS.'
151	*Doodia*	[R. Br.]	'(*Doodia* of Soland. is *Vandellia*)'
—	*Agrostris*:		
170, 171	[species 3–5]	—	'*Monarrhene* MS.'
171	[species 6, ?-9, also ?11]	—	'*Triarrhene* MS.'
180	*Eleusine*	Gaert.	'*Hippoetenium* MSS.'
—	Commelineae:		
269	OBS. . . . nec non speeies unguibus petalorum connatis . . . distinetum genus efformantes	—	'*Zygomenes* H. Tr. 1 p. 272'
270	*Aneilema*	[R. Br.]	'*Aphylax* MSS. Hort Trans.1.p.270 nomen autem jamdudum (in 1786) dietavit Dryander'
—	*Arthropodium*:		
276	4. *A. fimbriatum* . . . an proprii generis?	[R. Br.]	'*Hyponema* MSS. olim'
276	*Chlorophytum*	Ker in *bot. mag.*	'*Tristegia* in Laws.eat.'
280	*Luzuriaga*	Ruiz et Pavon	'*Calcoa* MSS.'
319	*Neottia*	Jaeq. Sw.	'*Ibidium* MS.'
320	*Calochilus*	[R. Br.]	'*Chilopogon* Dr.'
329	*Calcana*	[R. Br.]	'*Elasma* MS olim' [see also '*Caleya* MSS' above]
:	*Cymbidium*:		
332	OBS. *Limodorum nutans* Roxb. Corom.	—	'*Otandra* MS.'
332	*Sarcochilus*	[R. Br.]	'*Calopus* Laws.eat.'
332	*Dendrobium*	Swartz	'*Phellobium* MS'
332, 333	[speeies 2, 3]	—	'*Phellobium* MS.'

Table IV — Continued

Published text			*Annotation by Salisbury
Page no.	Genus name	Authorship	
332	1. *D. undulatum*	[R. Br.]	'*Amphistegia*'
333	6. *D. linguiforme*	Sw.	'*Wilfreda*'
344	*Damasonium*	Schreb. *gen. pl.* 242	'*Hymenotheca* MSS.'
—	*Thesium*:		
353	Species Americana *Thesium umbellatum* L. characte floris inter *Fusanum* et *Santalum* . . .	—	'*Nanodea* Soland. Cfr. Gaertn. vol. 3 sub *Nanodea*' [Gaertner refers the genus to Banks]
—	*Pimelea*:		
359	[species 1, 2]	—	'*Choniphile* "genus certo" D[r].'
362	III. [species 30]	[Unnamed infragenerie group]	'*Eetasium* MSS.'
—	*Petrophila*:		
364	I.	[Unnamed infragenerie group]	'*Atylus* MSS.'
364	II.	[Unnamed infragenerie group]	'*Petrophile* MSS.'
365	III.	[Unnamed infragenerie group]	'*Symphyglos*[*sum*] MSS.'
365	IV.	[Unnamed infragenerie group]	'[*Chioriza*] MSS.'
—	*Isopogon*:		
366	II.	[Unnamed infragenerie group]	'*Piptomone* MSS.'
—	*Grevillea*:		
376	I.A . . . *Lissostylis*	[R. Br.]	'*Lysanthe*'
378	I.B . . . *Ptyeoearpa*	[R. Br.]	'*Opiza* MSS.'
378	I.C . . . *Eriostylis*	[R. Br.]	'[*Hythrus*] MSS.'
379	28. *G. aspleniifolia*	Knight & Salisbury	'*Cyathema* MSS.'
379	30. *G. chrysodendrum*	[R. Br.]	'*Cyathema* MSS.'
380	?34. *G. mimosoides*	[R. Br.]	'*Gyale* MSS.'
380	35. *G. polystachya*	[R. Br.]	'*Gyale* MSS.'
438	*Centranthera*	[R. Br.]	'*Chelandra* S[r].'
—	*Adenosma*:		
442	OBS. Huie genus proximum constituunt *Ruellia uliginosa* et *balsamea*	—	'*Oryzetes*. I place this & *Adenosma* with *Themon Corea* in the Order of Nelsoneae' [see also pp. 478, 479]
—	*Orthostemon*:		
451	OBS. Genus medium inter *Canseoram* Lam. . . .	—	'(*Aspasia* MSS est *Canscora* Lam.)'
—	*Sebaea*:		
452	I. *S. ovata*	[(Labill.) R. Br.]	'*Aphelogyne* stylo uni strumoso'
—	*Mitrasacme*:		
454	II.	[Unnamed infragenerie group]	'*Dichomene* . . .'
454	III.	[Unnamed infragenerie group]	'*Ameriza*'
454	IV.	[Unnamed infragenerie group]	'*Exoterpe*'
—	*Villarsia*:		
456	I.	[Unnamed infragenerie group]	'*Limnanthes* MS? sen forte potius *Madonais* MS que *M. Indiea* L.'
—	*Cynanchum*:		
463	*C. pedunculatum*	[R. Br.]	'*Echyra* Dryand. MSS'
463	*C. floribundum*	[R. Br.]	'*Echyra* Dryand. MSS'
—	Apocineae:		
468	Sect. III.	[Unnamed infrafamilial group]	'Randolfae MSS'
469	Sect. IV.	[Unnamed infrafamilial group]	'Randolfae. Per. 2-dymum, nunc drupaceum'
—	*Justicia*:		
475	Ringentes calyce 4 partito . . .	[Unnamed segregate]	'*Laetandra* MSS.'
476	Sectio. 3tia	[Unnamed section]	'*Dizygium* MSS.'
476	I. [species 1–3]	[Unnamed group of species]	'*Laetandra* MSS.'
476	*Eranthemum*	Linn.	'*Coelosporum* MSS. [*Eranthemum* L. . . .] est aliud genus'
—	*Ruellia*:		
478	*R. maerophylla*	Vahl	'*Henioche* MSS.'
478	*R. balsama* et *uliginosa*	—	'*Oryzetes* MS' [including *Ruellia* 3-flora Roxb. le. 1150; see also p. 442]
479	*R. depressa* et *spinescens*	—	'*Themon* MS'
479	*Ruellia ovata*	Thunb.	'*Corea* MS.'
496	*Tournefortia* [Boragineae]	L.	'Tourneforteae Ord. mihi'
497	*Ehretia*	L	'ad Tourneforteae'
508	*Prostanthera*	Labill.	'*Euplectrum* Laws.Cat.'
—	*Myoporum*:		
516	III.	[Unnamed infragenerie group]	'*Andrewsia*' [no author: on prior page Brown has *Andreusia* (sic) Vent.]
524–528	Ebenaceae	Juss.	'Diospyreae MS.'
—	Epacrideae:		
537	[next to *Styphelia*]	[infragenerie group]	'*Sprengeleae* 2-braet. Per. caps. 5 valve'
		[infragenerie group]	'*Epacrideae* multi braet. Per. caps. 5 valve'
		[infragenerie group]	'*Styphcleae* multi braet. Per. drup. evalve'
		[infragenerie group]	'*Leucopogeae* 2-braet. Per. drup. evalve'

Table IV — Continued

Published text			*Annotation by Salisbury
Page no.	Genus name	Authorship	
540	[above *Lissanthe*]	—	'Sect.3. *Leucopogeae*'
547	*Acrotriche*	[R. Br.]	'*Acropogon* MSS. D^{r}.MSS'
—	*Lysinema*:		
552, 536	sp.5. *L .pungens*	[R. Br.]	'*Dolon* D^{r}. ob facium *Epacridis*.'[On p. 536] '*Dolon* D^{r}. differt a *Lysinemate* corolla 1-petala facie proxima *Epacridis* unde nomen'
—	*Campanula*:		
561	1. *Camanopsis*	[R. Br.]	'*Hemithyra* [S^{r}.]'
579	*Euthales*	[R. Br.]	'Sol.nomen ad aliud genus'
:	*Scaevola*:		
585	12. *S. microcarpa*	Cav.	'*Hemicharis* MS'

* In the few cases where Salisbury has cited publications with alternative names, it has yet to be established if these pre- or post-date the *Prodromus*. 'Lawson's Catalogue' is apparently an unpublished list not known to exist today (Mabberley 1980).
Abbreviations: R. Br., Robert Brown; D^{r}., Dryander; S^{r}., Solander; Laws., Lawson; MS or MSS without an authority presumably refers to a Salisbury manuscript, possibly the one in the British Museum (Natural History).
Generic and infrageneric names used in Salisbury's annotations are placed here in italics.

Table V

Statements and concepts in Robert Brown's (1810b) *Prodromus* which, according to annotations made by Richard Salisbury in a copy of the book held in the library of The Botanic Gardens of Adelaide, came from other botanists, mainly Dryander, but also Correa and O. Swartz*

Page no.	Published text [or summary]; underlining and asterisks by Salisbury are shown	Annotation by Salisbury	Translation of comment
161	Osmundaceae [diagnosis]	'Dryander told me that he separated this Order for their reticulated capsules'	
163	Ophioglosseae . . ./Capsulae *uniloculares, basi adnatae, subglobosae, coriaceae, opacae, exannulatae* . . .	'Hae fruct diagnosis Dryandri'	This diagnosis of the fruit by Dryander
169	Gramineae. [Remarks on generic composition and distribution of the infrafamilial groups]	'Most of these remarks relative to the geography of the grasses were made by Dryander, being before the author returned from New Holland'	
205	Colladoa *Cavan. l.c.* genuina species Ischaemi est, ut patet ex figura, et descriptione mutatis partium nominibus	'Sic dixit Dryander jamdudum . . .'	So said Dryander long before
270	Aneilema [R. Br.]	'Aphylax MSS. Hort. Trans. 1 p. 270 nomen autem jamdudum (in1786) dictavit Dryander'	Aphylax MSS . . . a name moreover long ago (in 1786) Dryander said often
311	Orchideae . . . OBS. III. Quoniam in Cypripedio habemus columnae lobos laterales antheriferos intermediumque sterilem, fas est reliquorum generum lobos laterales . . .	'Sic dixit Correa anno 1800'	Correa said this in the year 1800
320	Micrōtis [R. Br.]	'Microphylax MSS. Microtoa jam apud Swartz'	. . . Microtoa already in the writings of Swartz
325	Lyperanthus [R. Br.]	'Lyperanthus [inelusus] Lyperia dixit Dryander'	. . . included Lyperia said Dryander
400	Myristicaceae . . . OBS. II. [relations of *Knema* and *Myristica* etc.]	'Affinitatem cum Myristica jamdudum [?]it Dryand. in 1798'	Dryander [noted] the affinity with Myristica long before in 1798
442	Limnophila [R. Br.]	'D^{r}. with an E. jamdudum anno 1792'	Dryander's name spelt Limnophile long before in the year 1792
450	Gentianeae . . . OBS. [Paragraph concerning *Ophiorrhiza mungos* being in Rubiaceae close to *Oldenlandia; Mitreola* should be retained]	'Sic Dryander anno 1796'	Dryander [stated this] in this way in the year 1796
480, 481	Nelsonia [R. Br.] . . . Semina sine retinaculis . . . Dixi in memoriam DAVIDIS NELSON Hortulani meritisimi, qui in ultimo itinere Cookii plurimas novas species plantarum detexit . . .	'So named by Dryander long before Brown even came to London, who pointed out to me the seeds without retinaeula'	
533	Myrsine L. . . . OBS. Hujus generis sunt Myrsine africana . . . *Manglilla Juss.* . . . xSamara	'x"Samara est affinis Myrsine" D^{r}. in 1806, & long before when Swartz was here'	Samara is allied to Myrsine . . .
534	Myrsineae: Aegiceras Gaert. Koenig . . . OBS. . . . Jacquinia venosa *Sw.* diversissimi generis et etiam ordinis, nam Rubiacea est	'Sic dixit Dryander olim ante reditum auctoris in 1805 mense Octobris, veram affinitatem [Rizieeratis]'	So said Dryander in the past, before the return of the author [Brown] in 1805 in the month of October . . .

* Swartz, a Swede, worked in London in 1786–1787 (Stafleu & Cowan 1976–1978).

may shed light on this as well as provide confirmation of Salisbury's comments. These comments also need to be compared with published comments made by Salisbury in reviews to Brown's work (Mabberley 1980) which we have not seen.

Salisbury has attributed to Dryander authorship of 16 generic names and one infrageneric name which have always been attributed to Brown (Table IV). Brown, according to Salisbury, also used without acknowledgement six of Dryander's generic names in modified form (Table IV); one of these Salisbury also attributed to Solander. A number of other genera which had been recognized in manuscript or publication were also noted by Salisbury. We have not yet ascertained whether these predate the *Prodromus*.

Furthermore, Salisbury has alleged plagiarism by Brown of specific taxonomic concepts proposed by Dryander and others some years before Brown became established as a botanist (Table V; Fig. 2). Brown appears generally to have been very careful to acknowledge the contributions of others in his notes under the various taxa in the *Prodromus*. However, there is a complete absence of reference to Dryander's contribution to such concepts as the significance of the absence of the seed stalks of *Nelsonia* (Acanthaceae: Table V) and the geo-climatic relationships of the tribes of the grass family. When one also considers the alleged use of Dryander's manuscript names (Table IV), Brown could hardly have forgotten to acknowledge all of them. In view of the close relationship of the two botanists, who worked together for two days each week on the Australian flora after Brown's return from New Holland (Edwards 1981a), it is remarkable indeed that Dryander's name does not feature in the *Prodromus*.

Solander's name is likewise mentioned rarely in the *Prodromus*. It is limited to a few references under individual species to the 'Banks & Solander' manuscript; the genera *Sebaea* and *Hypoestes* are attributed solely to Solander by Brown. Solander's death 30 years before the *Prodromus* was published could hardly have excused Brown's ignoring his contribution. As has already been shown, he had made extensive use of Solander's manuscripts and the Banks and Solander herbarium.

Brown's fellow collectors on the voyage of the *Investigator*, Peter Good, the gardener and seed collector, and John Allen, the 'miner', are also notably unacknowledged in the *Prodromus*. Although at times Good collected independently of Brown (Edwards 1981b; Clarkson 1988), his specimens were incorporated without annotation within Brown's own herbarium and under his own labels (Edwards 1981b).

Who did Brown acknowledge in the *Prodromus*? There is mention in the preface of just two land-based collectors King and Paterson and of the voyagers Dampier, Lechenault (sic), Riedley (sic), Baudin, Menzies and Labillardière. His shipmate the artist Ferdinand Bauer is mentioned. In the relevant part of the text he gave credit to a number of contributions by fellow scientists.

Brown went to extreme lengths to acknowledge the contribution of Banks to his work. He mentioned him on the title page, in a full-page dedication, several times in the preface (as 'Illust. Banks'), in occasional references to the names of 'Banks and Solander', and in the citation 'B' indicating collections made by Banks and Solander. He was surely justified in his gratitude to Banks, but by today's standards this is disproportionately given.

Brown was undoubtedly driven to acknowledge Banks extravagantly for social, political and financial reasons. After all, at this time Banks was the influential leader of the scientific establishment. Without his sponsorship Brown may never have been or continued as a botanist. It was Banks's influence which gave him the opportunity of participating in Flinders's voyage which had embarked him upon his scientific career. After Dryander's death in 1810 Brown relinquished his employment with the Admiralty to succeed to the esteemed position of Banks's botanist-librarian. The *Prodromus* therefore was his first major publication and also came at a crucial time when he was cementing his place in the scientific world. It is noteworthy that 20 years later in his *Supplement* to the *Prodromus* on the Proteaceae, Brown (1830) listed on the title page collectors of the day who had assisted him and acknowledged assistance under the treatments of individual taxa in the text where collections or manuscript names of others were used (see next section). While Brown omitted to acknowledge contributors to his *Prodromus*, the situation was different later. Not only had Brown had no opportunity to collect further specimens, but, more importantly, he had also earned his botanical spurs to such an extent that he was revered by the scientific community, particularly on the continent.

It may not be coincidental that it was the two Swedes Solander and Dryander whose work invariably appeared without acknowledgement under the authorship of others. The knowledge and skills of these disciples of the great Linnaeus were needed by the English scientific establishment which sponsored their service in London. Rather than being equals of the members of this establishment, it is possible that they were considered the servants of Banks and, as a result, their manuscripts and ideas belonged to him and were fair game to those he favoured.

In contrast, Banks's third botanist-librarian was not foreign, and attained this position in his employer's years of decline in health. With the death of Banks in 1820, Brown was able to assume his botanical mantle. Had Brown worked under Banks at the height of his influence and ambition he would possibly have been treated in a similar fashion to Solander and Dryander.

C. The first resident collectors

An early attempt by Banks to place seed collectors in the colony of New Holland foundered (Finney 1984). George Austin and James Smith, both Kew trained, were the first two gardeners to be sent to the new colony in 1789 on the ill-fated voyage of the *Guardian*. They were in charge of a number of agriculturally important plants on the ship which had been specially fitted out for that purpose. They were to stay in New South Wales and send back plants and seeds for Banks and for Kew Gardens. Unfortunately the *Guardian* hit an iceberg on the outward voyage and the two gardeners, having abandoned ship, were never seen again.

At this time seed collectors could expect some financial reward (Finney 1984). Austin had apparently con-

tracted to send back seeds to a number of London nurseries despite Joseph Banks orders to the contrary. Finney (l.c.) also records that Governor Phillip had written to Banks in November 1788 that the person employed to collect seeds (presumably a convict) had sold most of them to people returning in the convict transports. Judge-Advocate David Collins made a similar complaint about convicts selling plants and animals (Cavanagh, this volume).

Twenty years later, in 1817 following his collecting expedition with the explorer John Oxley, Allan Cunningham wrote to Banks (reproduced in Gilbert 1986, p. 31) that convicts had collected 'ample Duplicates of many of my very interesting and valuable Seeds and bulbs . . . chiefly with a view of turning them to Cash, upon their return to Sydney'. These were believed by Cunningham to be in the possession of several wealthy people 'who intend to transmit them to their friends in England by the earliest opportunity'.

Thus the first exploitation of Australia's natural resources began early in the history of white settlement, with convicts collecting natural history items for financial gain. It will be shown that officers too collected for this reason, but they also sought scientific prestige and favour from patrons.

The Banksian collector George Caley recorded that Governor King had claimed all his natural history collections and journals (Currey 1967). In refusing to hand over his own collections, Caley said (p. 47):

> I cannot contrive what he wants such articles for unless they are designed as presents, whereby his name may be accorded in the annals of natural history, or for the public's benefit. But he has plenty of people at his call without bothering me. There is a person by the name of Lewin whom the Governor has had collecting for him, but I believe they now disagree, as he has not been able to collect him as much as he expected. There is also a person by the name of Gordon (who I knew when he worked in Chelsea Gardens) who is employed by Col. Woodford as a botanical collector; the Gov. has also applied to him to collect for him but he at once refused.[6]

Collectors within Australia in the 19th Century generally fall into two broad categories. Those who collected and recognized new plants and were capable of providing names will be dealt with in this section, while those who merely collected plants and then sent them to somebody else for naming are treated in a later section. In the main, the first group failed to publish their findings. As a result there is a predominance of early botanical names provided by European botanists who had never seen the plants they described in their natural habitat.

D. Collectors supplying manuscript names or diagnoses

William Paterson (1755–1810)

According to Gunn & Codd (1981) William Paterson was born in Montrose, Scotland, trained in horticulture at Syon House, London and was sent to southern Africa as a botanical collector in 1777. On his return to England Paterson obtained a commission in the 98th Regiment and spent 1781–1785 in India. He returned to Montrose in 1785 and occupied his time in producing an account of his African journeys.

William Paterson arrived in New Holland in 1791 as a captain in the 102nd Regiment. He had asked Banks to support his application to become a Fellow of the Royal Society before leaving England (Dawson 1958, D.T.C. 7.181). Banks advised him to postpone his application until he had been able to 'advance Natural History', suggesting that his departure for New South Wales would provide him with a good scope for discoveries (Dawson l.c., D.T.C. 7.182). Not only did Paterson collect natural history items for Banks but he also supplied seed to the Lee and Kennedy (Willson 1961) and Colvill (Andrews 1812, pl. 375) nurseries. While based on Norfolk Island he compiled an account of the flora and entrusted this to Banks. The manuscript is believed to be that in the Dixson Library collection[7] in Sydney. While it was undoubtedly useful for its time, it reveals that Paterson had only a limited knowledge of botany. He used only generic and common names, not binomials. On the basis of the botanical treatment for Norfolk Island Paterson asked for membership of the Royal Society. He wrote to Banks:

> In a letter to Gov. King you are so good as to offer me your assistance in publishing the Natural History of Norfolk Island, but my return from that place put it out of my power to finish what I first intended viz. The Birds and Fishes. However with the drawings &c. that accompany's this you will be in possession of the Botanical part, and from the few specimens of the strata which were sent before, you will be able to judge of the formation of the Island.
>
> Should you think the memorandums worth publishing or if it could be done by offering them to the Royal Society I would consider the Honor still greater, at the same time may I beg to solicit your interest of becoming a Fellow of the Society and hope by my attention to Natural History you will think me deserving of that honor.[8]

Banks declined to nominate Paterson for membership of the Society until his return to England. It was thus 1797 before Paterson was elected a Fellow (Finney 1984).

George Bass (1771–1803)

While more renowned for his explorations, Bass continued the tradition of other naval surgeons serving in Australia such as John White, Denis Considen and Archibald Menzies in being a keen observer and collector of Australian natural history curiosities. He too forwarded to Banks those items which survived his arduous voyages:

> In this voyage of fourteen weeks I collected those few plants upon Van Diemen's Land which had not been familiar to me in New South Wales, and have done myself the honour of submitting them to your inspection.[9]

Along with Paterson, he was made an honorary member of the Society for Promoting Natural History, which later merged with the Linnean Society (Finney 1984). Some of his observations were published in the second volume of David Collins's *An account of the English colony in New South Wales*. There is apparently an unpublished manuscript on the wombat within the Banksian papers held in the Mitchell Library, Sydney (Bowden 1952).

Archibald Menzies (1754–1842)

While on Vancouver's round world trip from 1791 to 1795, Archibald Menzies collected in 1791 at King Georges Sound, now Albany. The ship was based there for a fortnight which gave him

> the opportunity to examine the Country in various excursions around the Sound making a copious collection of its vegetable productions, particularly the Genus *Banksia* which were there very numerous.[10]

On his return to Britain Menzies curated his plant collections, comparing them with specimens in both the Banks and Linnaean collections. It is obvious that he recognized the difference between *Hakea* and *Banksia* as all the *Hakea* collections were labelled *Banksia spuria* Menz. with an appropriate distinguishing number. Thus *Hakea trifurcata* was 'Banksia spuria Menz. No. 8', *H. elliptica* 'Banksia spuria No. 7, Menz.' and *H. ceratophylla* 'Banksia spuria No. 6' (Savage 1964). From these annotations it is clear that he recognized the different species amongst the hakeas he saw. *Banksia coccinea* was also considered a different taxon, being annotated as 'Embothrium, No. 1 latifolium'.

Menzies may have been following the generic concepts of the day in coining this name. James E. Smith (1808, p. 118) said of the early collections of Proteaceae that:

> the many new kinds of Proteaecae, though by the judgement of Sir Joseph Banks and Dr. Solander readily separated from *Protea* itself, were not rashly subdivided into too many genera, till time, and an opportunity of observing them in different states, should throw sufficient light on the subjects. Some of them indeed, constituting a clear and certain genus, were made known to the younger Linnaeus by means of plates, and dried specimens, and named by him *Banksia*, but a number of doubtful species have remained unsettled under the temporary denomination of *false Banksiae* in the collections of those who had the opportunity of acquiring New Holland specimens.

In the Savage (l.c.) catalogue mention is made of a manuscript by Menzies. The original Menzies herbarium and the Menzies manuscript need to be investigated further to establish the extent of his contribution to the establishment of new species that were based at least in part on his collections. Thus James Smith attributed the name *Banksia grandis* to Menzies (Savage l.c.). However, Willdenow, who exchanged material with Smith, is always taken as the sole author of this species (e.g. George 1981a).

George Caley (1770–1829)

George Caley arrived in New Holland in 1800. Banks had asked for permission to send Caley to New South Wales in a letter to the Colonial Office in 1798 (reproduced in Currey 1967, p. 47):

> I have with me a young man who has for more than three years studied practical botany and horticulture under my directions, and who has, without the advantages of what is called a liberal education, made a considerable progress in both these branches of useful knowledge . . . As I am unwilling to recommend to the Government any person as a botanist who has not received a scientific education . . . I am desirous of taking upon myself the payment of his salary, for which he will, I have no doubt, make me a competent return.

Unlike other collectors Caley was not constrained to collect only for Kew Gardens and Banks but was also given permission to sell specimens to others (Dawson 1958[11]). He appears to have entered into some agreement with the Colvill nursery at least.

Caley established species limits and provided provisional names. Referring to the specimens which he had sent, he stated in his first letter to Banks (reproduced in Currey 1967, p. 39) that:

> I have met with several genera which appear to be numerous in species. In my remittances I have prefixed names to those plants that I have examined. I have not done it merely with an intent of their becoming standard ones, but for being less burthensome to my memory, as I find that figures tend to perplex if I use them in all cases. I do not doubt but what many of them inapplicable; yet, as far as I have been able, I have abided by some expressive character.

A few months later he was writing (Currey 1967, p. 65):

> I have sent enclosed with the letter a few descriptions of plants which, though appearing in a rude manner for the present, may be depended upon as accurate. I have used the language of Dr Withering, as being the most familiar to me. When I found a generic description was wanted I have given it in full . . . a learned botanist could easily put them in a learned language and shorten or lengthen them as he thinks proper.

In reply Banks in 1802 (reproduced in Currey l.c., p. 66) stated:

> Your descriptions of plants do you credit. Though roughly drawn they show an attention to the structure of the plants you have described, from which the botanist of perfect education may derive advantage.

By 1804, however, Caley (Currey l.c., p. 71) was to say to Banks:

> I have tried of late to use the language of Linnaeus in making descriptions, but I have to lament that this is above my reach, and I am afraid it will not be so easily understood.

A list of Caley's plants is included in Brown's unpublished manuscripts in the British Museum (Natural History) (Edwards 1981a). We have found no evidence of Caley's names being taken up. He is commemorated in *Caleana* and several specific epithets (Maiden 1908b).

Allan Cunningham (1791–1839)

> *I am perfectly certain that the Lilies are undescribed . . . It is likely enough that Cunningham knew them: but very few of his plants are published, and if unpublished they are new to the Botanical World.* (John Lindley to Thomas Mitchell[12])

The last of the collectors engaged by Joseph Banks on behalf of Kew Gardens was Allan Cunningham. According to his biography by McMinn (1970), he was the son of a Scottish gardener and was employed at Kew Gardens from 1810 or 1811 as assistant to W. T. Aiton in the preparation of *Hortus kewensis*. When Banks sought collectors for overseas duty in 1814 from amongst the Kew staff, Cunningham applied and was granted the appointment. Following two years' work in Brazil as a botanical collector, Cunningham was assigned to New South Wales, where he arrived in

December 1816. He brought with him a manuscript copy of Robert Brown's *Prodromus*.

Allan Cunningham left Australia in 1831, having made copious collections in both Australia and New Zealand. He had collected on Surveyor-General Oxley's Lachlan River expedition of 1817, on Phillip Parker King's coastal surveys between 1818 and 1822 (Curry & Maslin, this volume), within New South Wales from 1822 to 1825, within New Zealand in 1826 and on the Darling Downs in 1827. On his return to England, Cunningham resided near Kew and worked on his collections (McMinn 1970).

Cunningham provided names for plants he considered to be new. These are still to be seen today on his herbarium collections. Most of his manuscript names of Australian plants that reached publication appear in papers by various authors in the serials Hooker's (1829–1833) *Botanical miscellany* and de Candolle's *Prodromus* (1823–1873), while some were taken up by later authors. Accordingly the majority of his published names have authorship in the form 'Cunningham ex . . .', such as in *Eucalyptus sideroxylon* Cunn. ex Woolls, *E. acaciodes* Cunn. ex Maiden and *E. deglupta* Cunn. ex Maiden. In his appendix to Philip Parker King's voyages, Cunningham (1827) described no new plants, despite drawing up his own descriptions and supplying names in manuscript (Forbes *et al.* 1988). Instead he confined himself in publication to comments on individual families and left it to Brown to publish his new species. Unfortunately, Brown only ever treated the Proteaceae in his *Supplement* to the *Prodromus* (Brown 1830).

The only Australian names Cunningham published himself appear to be those contained in the *Appendix* to Barron Field's *Geographical memoirs of New South Wales* (Cunningham 1825, e.g *Stackhousia linariifolia* Cunn.). One is more likely to come across Allan Cunningham's names in the New Zealand flora on which he produced a series of papers (Cunningham 1837–1840) encompassing 589 taxa (Allan 1961).

Charles Fraser (? -1831)

Charles Fraser arrived in Port Jackson in 1816 initially as a soldier, and became the first Colonial Botanist and Superintendent of the Botanic Gardens in New South Wales. He collected plants with Allan Cunningham on Oxley's 1817 expedition and at Moreton Bay in 1828 (McMinn 1970). He was also quite capable of recognizing new species but there seems to be no evidence that he actually supplied names for them. The one exception encountered, *Castanospermum australe* Cunn. & Fraser ex Hooker, involves collaboration with one who frequently coined names. In his journal, reproduced in Hooker's *Botanical miscellany*, Fraser (1830a) said of the base of the Darling Ranges in Western Australia:

> The variety of plants seen on this tract was great: among the new ones observed, I may enumerate seven Hakea, a species of Lambertia, four species of Isopogon, three species of Leptospermum, a species of Petrophila, and a Liliaceous plant not seen in flower.

Of collecting at Moreton Bay, reproduced in the same publication (Fraser 1830b), he said:

> I ascendend Minto Craigs, where I found an unpublished species of Acacia, one of Hovea, Lasiopetalum, Croton, Leptospermum, of Aspidia and Alyxia . . .

In letters to W. J. Hooker, reproduced in *Hooker's Journal of Botany*, James Drummond (1840, 1842) referred to 'Among the *Hakeas*, Frazer's *cristata*', '*Xylomela* . . ., I suppose *occidentale* of Frazer', *Dryandra bi[p]innata* of Frazer', '*Diplophragma bipinnata* of Frazer', and '*Anigozanthus latifolia* of *Frazer*' (Table VIII). The first four of these species were published by Robert Brown in 1830 in his Supplement to the *Prodromus*, based on collections supplied by Fraser; the third and fourth names obviously refer to '*Dryandra* (*Diplophragma*) *bipinnatifida*' in this work. There is no indication in the Brown publication that Fraser supplied these names.

The possibility that Drummond was referring to Fraser only as collector of these species is discounted with the case of the *Anigozanthos* species. There is no evidence that 'Anigozanthus latifolia' was ever published (cf. *Index kewensis*; Geerink 1970; Hopper 1987). Fraser's 'red and green' kangaroo paw was later named *A. manglesii* by the British botanist D. Don in 1835. What then was Drummond's source of the name? It may have appeared in one of Fraser's manuscript reports on the Swan River Colony, a copy or extract of which could well have been available to Drummond in his capacity of Government Naturalist in the newly founded colony from 1829. Fraser's several reports on the region were part of Captain James Stirling's 1827 survey of the Swan River area with the view to settlement (Finney 1984); of these at least two were published (Fraser 1830a; the other in the 1829 *Quarterly review* cited by Finney l.c.), while another was read to the Linnean Society. Drummond's passage to the colony from England in 1829 was with the *Parmelia* and *Sulphur* under the command of Stirling (Erickson 1969), who presumably would have made his reports available to the settlers. There are no new binomials by Fraser in the above published extracts from his reports but they may appear in reports accompanying Stirling's case for the establishment of a colony.

A list of Fraser's collections on Oxley's expeditions and a list of plants from the Swan River and Moreton Bay are contained amongst Brown's unpublished manuscripts (Edwards 1981a).

William Baxter (fl. 1823–1829)

Little is apparently known of William Baxter who collected in Western Australia in 1823–1825 and in 1829. His itinerary elsewhere along the southern coast of Australia is poorly documented (R. Grandison, unpubl.). Allan Cunningham, on a Baxter collection of *Hakea uliciua* in the Meissner Herbarium in New York, stated that Baxter had noted it as coming from Twofold Bay. Although Cunningham considered that the location may have been erroneous this locality falls in the range of this southeast Australian species. Grandison (pers. comm. 1989) has since been able to confirm from shipping records that Baxter did visit Twofold Bay.

Before his arrival in Australia Baxter was employed as a gardener to the Contesse de Vandes at Bayswater (Sweet 1827–1828, t. 56). While in Australia he was employed by a Mr Henchmann, obviously an importer

of New Holland plants as there are numerous references throughout Sweet's (1827–1828) *Flora australasica* to Mr Henehmann's collector, Mr Baxter. He also sent seeds to other nurserymen according to his remark in a letter addressed to Charles Fraser of the Sydney Botanic Gardens wherein he commented (Maiden 1909) that 'it will take up too much time to put up my seeds to the different parties I wish to send them to'.

Baxter did provide names for at least some of the specimens he supplied: *Banksia dryandroides* and *Banksia brownii* are both attributed to him, the first by Sweet (1827–1828, t. 56) and the latter by Brown (1830), who obtained the name in a letter. The specimen of *Hakea ulicina* in the Meissner Herbarium mentioned above had been annotated by Allan Cunningham 'Hakea stenophylla Baxter mss.' As with Fraser, James Drummond also attributed names to Baxter (Table VIII). Whether Baxter supplied any other names is not known. Again there is a list of Baxter collections for 1823 and another for 1830 among Brown's manuscripts (Edwards 1981a).

Ronald Gunn (1808–1881)

Much has been written on the Tasmanian collector Ronald Gunn (e.g. Burns & Skemp 1961; Buchanan 1988, this volume) who made rich collections in Tasmania and a few in parts of Victoria. His specimens for the major part were sent to W. J. Hooker, accompanied by copious notes ('I have written Sheets of Remarks on each as usual': Burns & Skemp l.c., p. 75). Gunn had, however, an obvious talent for distinguishing species in the field. He supplied each species he came across with a unique number which should not be confused with a collection number (Burns & Skemp 1961; Haegi 1982). For example, in tackling the problems of *Euphrasia collina* and its allies, he noted on one of his collections of the subspecies *tetragona* in the Hooker Herbarium:

> This very beautiful species is very common in sandhills, &c. in the neighbourhood of the sea at Circular Head and Woolnorth, flowering during the latter part of October and early in Novb. In my earlier collections I am afraid I have sadly confounded different species of Euphrasia, and, to commence clearing up matters, I give this a new number to begin with.[13]

Only four examples of Gunn supplying manuscript names have been found: *Correa ferruginea* Gunn ex W. J. Hook., now placed under *C. lawrenciana* W. J. Hook., *Blandfordia backhousii* Gunn ex Lindley, now *B. punicea* (Labill.) Sweet, *Boronia citriodora* Gunn ex J. D. Hook., and *Macdonaldia antennifera* Gunn ex Lindley, now *Thelymitra antennifera* (Gunn ex Lindley) J. D. Hook. That he provided few names may be explained by his comment to W. J. Hooker (Burns & Skemp 1961, p. 75):

> Backhouse used to say — Better give a plant a wrong name than none at all, but I am not inclined to follow that principle as I find erroneous names once given most pertinaciously adhere — whereas a plant without a name is ready to receive the true one.

This attitude may reflect Gunn's different background from those collectors dealt with previously. All of them had been exposed to the learned scientific societies, to Kew Gardens or to the nursery trade. Gunn's interest in natural history seems only to have arisen after his arrival in Tasmania and dated from his introduction to Robert Lawrence. Lawrence too had no formal training in botany or zoology, but throughout his diary (Burns & Skemp 1961, p. 5) he apparently used Linnaean binomials. Like Gunn, Lawrence included quite detailed descriptions, after the Linnaean system, of species which he considered to be new. He died young, before he could make a substantial contribution to natural history.

Gunn's field observations and distinguishing characters undoubtedly assisted the Hookers of Kew greatly in delimiting and describing many Tasmanian species. This is reflected in the number of species they named after him. Today, in a different era, he might well have been offered co-authorship of many of the species he distinguished.

James Backhouse (1794–1869)

A Quaker missionary and York nurseryman, James Backhouse visited the Australian colonies between 1832 and 1838 enquiring into the welfare of convicts. He collected in every colony. As well as publishing extensively on his travels (Baker 1869; Maiden 1908a,b), he produced two botanical works. The first was an account of the food plants of Tasmania (Backhouse 1834; also Hooker 1836). The second was a florula of the island (Backhouse 1835), 'aided by Mr Ronald Gunn' according to W. J. Hooker (1837) in the introduction to the reproduction of this work. Gunn himself made no such claim in correspondence with Hooker (Burns & Skemp 1961). Both works were published in Ross's *Almanack*. No new species were described, but comments were made on species concepts. Many of Backhouse's collections were described by W. J. Hooker who, with William Harvey, named the genus *Backhousia* after him. Joseph Hooker and Ferdinand Mueller also named species after him (Maiden 1908a). There are apparently two manuscript volumes of his at Kew entitled 'Botany of New South Wales' (Maiden 1908b) and it would not be surprising if manuscript names were used in view of Gunn's above-quoted statement on the desirability of giving plant names. Indeed, the Tasmanian species *Craspedia alpina* of Backhouse was published by J. D. Hooker (1847) from a Backhouse manuscript (probably that cited above) in the Hooker herbarium.*

James Drummond (1784–1863)

According to his biographer Erickson (1969), James Drummond, while a young man, was curator of the Cork Botanical Gardens in Ireland and collected in the Kerry Mountains. He was elected a member of the Linnean Society in 1810. In 1829 Drummond arrived in the Swan River Colony as the honorary Government Naturalist. For some years he conducted the Botanic Garden. However, when financial support for this project was withdrawn, he transferred to the Hel-

* Note added in proof — A recent article on James Backhouse [P. Davis, *Archives Nat. Hist.* (1989) 16: 247–260] confirms that Backhouse did use manuscript names. In his 2-volume *Recollections of the Botany of New South Wales, Van Diemen's Land and their Dependencies* there are 63 names given to species he regarded as new. None of these were ever published by Backhouse, although *Craspedia alpina* and *Drosera auriculata* were both attributed to him by J. D. Hooker.

ena Valley and in somewhat straitened circumstances embarked on a career as a botanical collector, collecting seeds and sets of dried plants for sale in Europe.

Drummond was not only a prolific collector but also had a discerning eye for the species making up a spectacular flora, writing informatively about the differences between the species he collected. As well as assisting Drummond with collecting, it seems that many of his family were involved to some extent in the business of recognizing new taxa. Thus in one of his initial letters to Hooker (from Drummond 1840) he wrote:

> My family, although they know little of the science of botany, are several of them well acquainted with most of our plants and have paid a good deal of attention to the orchideae, and we have gathered between sixty and seventy species . . . My youngest daughter Euphemia knows the Swan River Orchideae quite as well as I do myself. She is able to tell any of her brothers who pick up an Orchis whether there is any chance of its being what we call a new one or not. Some of our genera, for we found it necessary to make genera to help in distinguishing the different species, turned out to be exactly the same with Mr Brown's.

Later in response to the arrival of some plates with the *Journal of Botany*, he wrote (Erickson 1969, p.67):

> The very first of the detached plates you sent me which we happened to look upon was immediately recognised by my daughter Euphemia, as one of her plants which she was the first to discover and she is quite delighted that you have thought it worthy of publication.

Drummond did use binomials, but only on a fairly limited basis and usually for spectacular plants. Most of his own names were published as reproductions of his letters to W. J. Hooker in the various journals Hooker edited at the time. For example, *Banksia hookeri*, now treated as *Banksia solandri* R. Br., and *Hakea victoria* were published in *Companion to the botanical magazine*, *Pterostylis rupestris* and *Hovea*

Table VI

Binomials in extracts of James Drummond's letters published in the various journals edited by W. J. Hooker*

Drummond's name	Place of publication	Date	Current taxonomic status, as cited
Melaleuca amara	*J. Bot.* (*Hooker*) 2: 361	1840	Never considered to our knowledge
Hovea grandiflora	*J. Bot.* (*Hooker*) 2: 365	1840	= *Hovea trisperma* Benth. (Ross 1989)
Pterostylis rupestris	*J. Bot.* (*Hooker*) 2: 367	1840	Never considered to our knowledge
Leschenaultia sanguinea	*J. Bot.* (*Hooker*) 2: 369	1840	Never considered to our knowledge
Comesperma scoparia	*J. Bot.* (*Hooker*) 2: 369	1840	*Comesperma scoparium* J. L. Drummond (Thompson 1978; Stove 1986); still cited in Western Australian literature (e.g. Green 1985) as *C. scoparia* Steetz (1848), a later name based on a Drummond specimen
my *Diplophragma spiralis*	*J. Bot.* (*Hooker*) 4: 81	1842	Never considered to our knowledge
Loudonia flaveseens	*London J. Bot.* 1: 396	1842	*Glischrocaryon flavescens* (Drumm. ex Hook.) Orchard
Drakaea livida	*London J. Bot.* 1: 628	1842	Being taken up by M. Clements, in press (S. D. Hopper, pers. comm. 1989)
Drakaea lucida	*London J. Bot.* 1: 628	1842	Being taken up by M. Clements, in press (S. D. Hopper, pers. comm. 1989)
Dasypogon hookeri	*London J. Bot.* 2: 169	1843	*Dasypogon hookeri*
Boronia molloyi	*London J. Bot.* 2: 170	1843	*Boronia molloyae*
Dryandra floribunda	*London J. Bot.* 3: 308	1844	= *Dryandra floribunda* R. Br.
Dryandra quercifolia	*London J. Bot.* 3: 313	1844	*Dryandra quercifolia* Meisner, a later name based on a Drummond specimen
Huttia quadriflora . . .if new	*London J. Bot.* 3: 314	1844	Never considered to our knowledge (a legume; non *Huttia* J. L. Drumm. in Harvey 1855, nec Preiss)
Banksia hookeri	*Bot. Mag.* 74, *Comp.* 1	1848	*Banksia hookeri* J. L. Drumm., *nomen nudum*, = *B. solandri* R. Br., according to George (1981). '*Nomen nudum*' is incorrect; there is a more than adequate description of the plant, nor was George correct in indicating that it was cited as a synonym of *B. solandri* in the protologue.
Hakea victoria	*Bot. Mag.* 74, *Comp.* 2	1848	*H. victoria* Drumm.
Gastrolobium leakeanum	*Hooker's J. Bot. & Kew Gard. Misc.* 1: 247	1849	Never considered to our knowledge
Banksia floribunda . . .	*Hooker's J. Bot. & Kew Gard. Misc.* 1: 375	1849	*nomen dubium*: = *Banksia occidentalis* R. Br. or *B. littoralis* R. Br. var. *seminuda* A. S. George (George 1981a)
Stylidium elegans	*Hooker's J. Bot.& Kew Gard. Misc.* 1: 376	1849	Never considered to our knowledge
Acacia neilii . . . if new	*Hooker's J. Bot. & Kew Gard. Misc.* 1: 377	1849	Never considered to our knowledge
Verticordia grandis	*Hooker's J. Bot. & Kew Gard. Misc.* 5: 119	1853	*Verticordia grandis* Drummond; in Western Australian census (Green 1985) incorrectly cited as *V. grandis* Drumm. ex Meisn., *J. Linn. Soc. Bot.* 1: 42 (1857)
my *Lawrencella lanceolata*	*Hooker's J. Bot. & Kew Gard. Misc.* 5: 312; 5: 402	1853	[? = *Helichrysum* sp. as *Lawrencella* Lindley is a synonym of that genus]
Templetonia regina	*Hooker's J. Bot. & Kew Gard. Misc.* 5: 312	1853	= *Brachysema aphyllum* Hook. (Ross 1982)
Diuris picta	*Hooker's J. Bot. & Kew Gard. Misc.* 5: 347	1853	Being taken up by M. Clements, in press (S. D. Hopper, pers. comm. 1989)

* Because they appear in letters published under Drummond's authorship, the author of the names should be Drummond alone. All but one are accompanied by descriptions of sufficient diagnostic detail to qualify them as validly published names under the botanical code. Drummond's description of *Dryandra quercifolia*, 'A *Dryandra* with the foliage very similar to the *Luccombe Oak* might be appropriately called *D. quercifolia*' seems also adequate for valid publication of his name; it is known commonly today as the oak-leaved dryandra. In two cases, *Huttia quadriflora* and *Acacia neilii*, Drummond's names were provisional only.

grandiflora in Hooker's *Journal of botany and Kew Gardens miscellany*, and *Dasypogon hookeri* and *Boronia molloyi* (now altered to *B. molloyae*) in Hooker's *London journal of botany*. Other names to appear in his published letters are given in Table VI. Some of these have never been taken up despite their often more than adequate description.

Drummond sought to dedicate the black kangaroo paw, discovered by his son Johnston (Erickson 1969), in memory of his friend Mrs Georgiana Molloy who also collected specimens and seeds for British interests (Moyal 1986). He wrote to the editor of the Perth newspaper *The Inquirer* in June 1843 describing the plant and stating that 'Anigozanthus Molloyiae is a most remarkable plant and it may be said to be a true mourning flower' (Erickson 1969, p. 86). Unfortunately this letter was never published and the species was officially described in 1847 by Hooker as *Anigozanthos fuliginosus*. Later Drummond gave it a new generic name *Macropidia*, published by W. H. Harvey (1855b) with acknowledgement to Drummond, in Hooker's *Journal of botany*.

In fact a series of genera and species were attributed to Drummond by W. H. Harvey in this paper (Table VII). Harvey (1855a: his italics) wrote:

> I send you by post a paper by Drummond, on the Botany of the Northern Districts of the Swan River Colony . . ., and characters of certain new genera, which he requested me to examine and describe. The poor man feels rather sore that so many new genera should *first* have appeared in Preiss's book, which had been sent home by him (Drummond) years before Preiss visited the Colony; so I am anxious to preserve for him any little gleanings that may remain. The most curious of the genera described by me are the *Rutaceous*; and what I have called *Dicrastylis*, which appears to me to be either a *Cordiacea* with opposite leaves, or the type of a new Order, between *Cordiaceae* and *Verbenaceae*. I suppose you will find specimens of all in your last set of Drummond's plants. I hope you will allow *Drummondita* to stand, as D. feels rather uncomfortable in their being no *universally acknowledged* genus bearing his and his brother's name. He himself selected and proposed this plant for a '*Drummondia*; but with your genus of Mosses staring me in the face, I had to alter the name.

Apart from *Drummondita* the authorship of which is attributed solely to Harvey, even though it was Drummond who distinguished it and selected the type, the several genera involved are all attributed to 'Drummond ex Harvey'.

There is no doubt that Drummond contributed substantially to the erection of new species and genera in publications emanating from Kew. It is unknown to us the extent to which Drummond's duplicated sets of specimens, sold to others, were supplemented by informative notes such as were received by W. J. Hooker. However, none of the Drummond specimens we have seen from many herbaria bear anything in his hand other than his collection number.

As a result of this *ad hoc* method of publication of botanical results, Drummond probably missed out upon gaining credit for at least some of the new species

Table VII
Binomials attributed to James Drummond by William Harvey in a paper published in 1855 in *Hooker's J. Bot. Kew Gard. Misc.* (Harvey 1855b) with current taxonomic status*

Drummond's name, as published	Current taxonomic status (from Green 1985, unless otherwise stated)
Huttia J. Drummond	*Hibbertia* Andrews[1]
Huttia conspicua J. Drummond	*Hibbertia conspicua* (J. Drummond ex Harvey) Gilg
Hemisteplus J. Drummond	*Hibbertia* Andrews
Hemisteplus linearis J. Drummond	? *Hibbertia spicata* F. Muell.; non *H. linearis* R. Br.ex DC. (1817)
Gcococcus J. Drummond	*Geococcus* J. Drummond ex Harvey (Hewson 1982)
Geococcus pusillus J. Drummond	*G. pusillus* J. Drummond ex Harvey (Hewson 1982)
Calopetalon J. Drummond	*Billardiera* (Bennett 1972)
Calopetalon ringens J. Drummond	*B. ringens* (J. Drummond ex Harvey) E. M. Bennett (Bennett 1972)
Drummondita Harv.	*Drummondita* Harv.
Drummondita ericoides Harv.	*Drummondita ericoides* Harv.
Sandfordia J. Drummond	*Geleznowia* Turcz.
Sandfordia calycina J. Drummond	*G. verrucosa* Turcz.
Symphyopetalon J. Drummond	*Nematolepis* Turcz.
Symphyopetalon corraeoides J. Drummond	*N. phebalioides* Turcz.
Urocarpus J. Drummond	*Urocarpus* J. Drummond ex Harvey
Urocarpus phebalioides J. Drummond	*U. phebalioides* J. Drummond ex Harvey
Platyptelea J. Drummond	*Aphanopetalum* Endl.
Platyptelea clematidea J. Drummond	*A. clematideum* (J. Drummond & Harvey) Gardner
Cheynia J. Drummond	*Balaustion* Hook.
Cheynia pulchella J. Drummond	*B. pulcherrimum* Hook.
Dicrastylis J. Drummond	*Dicrastylis* J. Drummond ex Harvey (Munir 1978)
Dicrastylis fulva J. Drummond	*D. fulva* J. Drummond ex Harvey (Munir 1978)
Dicrastylis reticulata J. Drummond	*D. reticulata* J. Drummond ex Harvey (Munir 1978)
Dicrastylis stoechas J. Drummond	*D. corymbosa* (Endl.) Munir (Munir 1978)
Macropidia J. Drummond	*Macropidia* J. Drummond ex Harvey (Hopper 1987)
Macropidia fumosa J. Drummond	*M. fuliginosum* (Hook.) Druce (Hopper 1987)
Xanthorrhoea drummondii Harv.	*X. drummondii* Harv. (Bedford 1986)
Lepilaena J. Drummond	*Lepilaena* J. Drummond ex Harvey
Lepilaena australis J. Drummond	*L. australis* J. Drummond ex Harvey

* Apart from the name the protologue of each taxon is by Harvey. Therefore, under the present *Code*, the author citation should be *J. Drummond ex Harvey*. However, the current methods of author citation give no credit to the fact that Drummond recognized the plants he named as distinct and that he provided Harvey with diagnostic characters (his 'characters': cf. quote from Harvey 1855a) for each taxon.
[1]*Huttia* Preiss ex Hook. is different from Drummond's genus of that name. It is a *Calectasia*.

Table VIII

Binomials in extracts of James Drummond's letters which were published in the various journals edited by W. J. Hooker and with authorship attributed to botanists other than the publishing authors*

Names, grouped under authors as published in Drummond's letters	Place of publication	Date	Current taxonomic status, authorship as cited
William Baxter			
Dryandra senecifolia	*J. Bot.* (*Hooker*) 4: 85	1842	*D. senecifolia* R. Br.
Dryandra squarrosa	J. Bot. (*Hooker*) 4: 85	1842	*D. squarrosa* R. Br.
Banksia brownii	*Hooker's J. Bot. Kew Gard. Misc.* 1: 375	1849	*B. brownii* R. Br.
Charles Fraser			
Xylomela occidentale	*J. Bot.* (*Hooker*) 2: 347	1840	*X. occidentale* R. Br.
Anigozanthus latifolia	*J. Bot.* (*Hooker*) 2: 348; *London J. Bot.* 1: 628	1840 1842	Never used to our knowledge
Hakea cristata	*J. Bot.* (*Hooker*) 2: 355	1840	*H. cristata* R. Br.
Petrophila linearis	*J. Bot.* (*Hooker*) 2: 355	1840	*P. linearis* R. Br.
Diplopfragma bipinnata	*J. Bot.* (*Hooker*) 4: 81	1842	*Dryandra bipinnatifida* R. Br.
Dryandra bipinnata	*J. Bot.* (*Hooker*) 4: 85 *London J. Bot.* 1: 629	1842 1842	? *D. bipinnatifida* R. Br.
Banksia grandis London	*J. Bot.* 1: 87	1842	*B. grandis* Willd.[1]
Allan Cunningham			
Xylomelon salicifolia	*J. Bot.* (*Hooker*) 4: 80	1842	*Xylomelum salicinum* A .Cunn. MSS in Brown (1830)
Baron von Huegel			
Kennedya arenaria	*J. Bot.* (*Hooker*) 2: 357	1840	*K. arenaria* Endl., *Enum. Pl. Huegel* (1837) 38
Hibiscus hakeaefolius	*J. Bot.* (*Hooker*) 2: 361	1840	*H. hakeaefolius* Giord.
Eucalyptus occidentalis	*London J. Bot.* 2: 180	1843	*E. occidentalis* Endl., *Enum. pl. Huegel* (1837) 49
Ranunculus coloneus	*London J. Bot.* 2: 182	1843	*R. colonorum* Endl., *Enum. Pl. Huegel* (1837) 1
Ludwig Preiss			
Anigozanthos moorii	*London J. Bot.* 1: 628	1842	*A. bicolor* Endl. (1846) (S.D. Hopper, pers. comm. 1989). The description of *A. moorii* Preiss ex J. L. Drummond is more than adequate and this would predate *A. bicolor*. Bentham (1873) mentions an anonymous collection in Herb. Hooker collected in 1839 and annotated as *A. mooreana*, mihi.
Melaleuca leakei	*London J. Bot.* 2: 168	1843	*Nomen nudum*. A name never validly published (see p. 000)
Grevillea drummondii	*London J. Bot.* 3: 304	1844	At that stage not published; = *Grevillea tridentifera* Meisn. non *G. drummondii* Meissn. (1845)

* In most cases the protologue is based upon these botanists collections, but Drummond's citation raises at least the possibility that they provided the name in each case. In some cases it is possible that he was referring to the discoverer (initial collector) of the species rather than the person providing the name. Apart from Fraser, each of these botanists is known to have used his own informal binomials.

[1] *B. grandis* was also attributed by James Smith to Archibald Menzies, (q.v.).

he discovered and named. Even those which were published by Hooker have often been overlooked and are only now being recognized (Table VI). One example is *Comesperma scoparia* J. L. Drumm., which has been attributed to Joachim Steetz up to the present day (Green 1985).

Drummond attributed names to other collectors in south-western Australia, namely Fraser, already mentioned, Allan Cunningham, Ludwig Preiss, Baron von Huegel and William Baxter (Table VIII). This raises the question of whether these collectors might also have provided the names. Only Cunningham was given credit for the name cited by Drummond by the publishing author.

Ludwig Leichhardt (1813–1848)

> *He is something far superior to a mere Botanical Collector.*
> (William Macarthur[14])

More usually thought of as an explorer than a botanist, Ludwig Leichhardt was born and educated in Germany. There is no doubt that Leichhardt was one of the most highly qualified scientists to come to Australia and it is sad that so much of the information he gathered has remained inaccessible until now in his unpublished diaries. Without doubt his contribution to science would have been substantial and wide-ranging had he not been so intent on exploration at the expense of publication and had he not died prematurely. A full account of his extensive preparatory studies in natural history and other subjects in Europe has recently been provided by Roderick (1988). A brief account of these is provided here.

During the years 1832 to 1837 Leichhardt studied a variety of subjects at Göttingen and Berlin Universities. At the latter he met the Englishman William Nicholson who was to support him financially for a number of years. After Nicholson completed his medical studies he returned to England, followed shortly after by Leichhardt who arrived there in May 1837. The pair embarked on a natural history tour of Somerset and Devon before moving to London where they spent the next 8 months studying the collections in the British Museum and the museum of the Royal College of Surgeons, their chief interest at this stage being comparative physiology. In June 1838 they crossed to Paris where they attended courses in natural history at Jardin des Plantes and the associated

Museum of Natural History as well as at the Sorbonne. In the discipline of botany, Leichhardt attended lectures and field work given by Adrien de Jussieu, the last of the great Jussieu dynasty (Stafleu 1971), but he also attended lectures in zoology, anthropology, geology, palaeobotany, ornithology, entomology and meteorology as well as some medical lectures and clinics. All of this was done with the express purpose of 'interpreting Nature' in Australia. With this in mind, during 1840 Leichhardt 'catalogued' the Australian and tropical flora in the Jardin des Plantes. While in Paris Leichhardt lodged in the same building as the botanist Gaetano Durando who was to become agent for the sale of his Australian collections.

Between September 1840 and June 1841, before embarking for Australia, Leichhardt and Nicholson engaged in a tour of France, Italy and Switzerland, with Leichhardt taking every opportunity to study geological features and items of natural history. At the end of this time Nicholson decided not to accompany Leichhardt to Australia but did continue to support him financially. Leichhardt was encouraged to send any undescribed specimens back to the museum in Paris. However, at this stage he hoped to come to some arrangement with William Hooker to whom Philip Webb had written a letter of introduction. His meeting with Hooker in September 1841 was totally discouraging. Hooker suggested New Zealand as a better place for a collector as he already had Drummond and Preiss in Australia. Besides there was very little new to be discovered there! Furthermore he did not approve of all-round naturalists, preferring to deal only with botanists. Nor did he offer any letters of introduction to his contacts in Australia.

This disinterest on Hooker's part in the highly educated student is almost certainly the reason why Leichhardt is not better known as a botanist. Had his notes and collections gone to Hooker at least some of Leichhardt's new taxa would have appeared in the journals which Hooker edited. Instead the collections mostly ended up in the herbaria at the Jardin des Plantes and at Sydney's botanic garden. From the latter they were later borrowed by Mueller (Maiden 1908b). However, by the time they were used by botanists such as Mueller, their importance had diminished by the accession of further collections from the regions Leichhardt had visited. We are uncertain of the sources of Leichhardt's collections examined by Bentham in the compilation of *Flora australiensis*. Prior to assembling his 'major botanical collections' from the Newcastle-Moreton Bay area, Leichhardt had sent specimens to Pamplin, a London dealer in natural history specimens who often acted as W. J. Hooker's agent (Roderick l.c., p. 236); some of these may have come to Kew. Others were amongst the many collections sent to Bentham by Mueller.

Leichhardt embarked for Australia in October 1841 having already informed his family that the 'interior, the unknown core of the continent, is my goal, and I will never give up until I reach it' (Roderick l.c.,p.155). He arrived at Port Jackson in February 1842. Although without an introduction from Hooker, he did have one to Sir Thomas Mitchell from Richard Owen, the well-known anatomist and palaeontologist. Mitchell invited Leichhardt to accompany him on his next prospective northern expedition, which was to eventually take place in 1846 (see later). In the meantime Leichhardt was offered a number of positions, which he declined. One vacancy which he was drawn to was that of superintendent of the Sydney botanic gardens (Gilbert 1986; Roderick l.c.). Despite strong representations by a section of the Sydney establishment, it was given to an elderly gardener.

In an account of his activities Leichhardt (1845) wrote to Durando on 6 January 1844 that he had

> quitted Sydney, after having devoted six months to studying the Botany of its environs, with the assistance of R. Brown's 'Prodromus' and the 7th Volume of De Candolle's great work. There were several tribes of plants, however, which I could not investigate; the Euphorbiaceae, for instance, because I had not the necessary books: among the other kinds, I made greater progress; and soon found myself competent to undertake some public herborizations, the first ever known in this colony, and to give a course of lectures on Botany, when I endeavoured to explain the structure of the different families of plants, and especially to direct the attention of the inhabitants, during their walks to the more common and prevalent species, particularly Myrtaceae, Rutaceae, Proteaceae, Epacrideae, and Cycadeae.

Leichhardt then carried out extensive field studies between September 1842 and April 1844 in the area between Newcastle and Moreton Bay. During this time he made the acquaintance of many of the land holders who were later to become his sponsors. As a result of his studies he was able to write to Durando on 12 July 1844 (Leichhardt 1845):

> I have sent a collection of plants to the museum of the Jardin des Plantes, which I hope may give satisfaction; but let it not be forgotten that these specimens were gathered in a country where I was in frequent risk of my life, and where every energy was required to enable me to travel, and partially to endure, fatigue, hunger, and thirst! I was compelled to cut down wood for firing, with my own hands, and to cook my food, while I was also a geologist and botanist, and to wash my own linen and dry my specimens, often passing ten days and a fortnight in the forests, without any companion but my horse and my dog. If I had not occasionally been assisted by friendly and hospitable individuals, I must have been compelled to relinquish my journey, and to discontinue my collections.

In August 1844 Leichhardt set out on his successful journey from Moreton Bay to Port Essington (Jackes, this volume). The journey completed in December 1845, Leichhardt returned to Sydney to prepare his account of it before setting out on his next expedition. The published narrative (Leichhardt 1847), edited by Phillip Parker King, contains numerous observations on natural history, particularly plants. To cite just a few examples, on 19 October 1844:

> On a botanical excursion I found a new Loranthus, with flat linear leaves, on Casuarina, a new species of Scaevola, Buttneria, and three species of Solanum;

on 13 January 1845:

> I observed a new species of Flindersia, a small tree about thirty feet high, with thin foliage and very regular branches, forming a spire;

and on 19 March 1845:

> On the plains I found two new species of Sida; and, on tea-trees, a new form of Loranthus, with flowers in threes

> on a broad leafy bract, scarcely distinguishable from the real leaves.

No effort was made to provide a binomial except in two cases, the first on 22 October 1844:

> On the banks of Hodgson's Creek, grows a species of Dampiera with many blue flowers, which deserves the name of 'D. floribunda;

and the second on 25 November 1844 when he commented on:

> a new species of forest oak, which deserves the name of Casuarina *villosa*, for its bark looks quite villous.

Neither of these names has ever formally been applied to these plants. Perhaps these specimens were amongst those destroyed by Leichhardt, as described in this extract of his hardships in a further letter to Durando (Leichhardt 1846):

> But you must bear in mind, my good friend, that it was not my lot to travel all at my ease, with every convenience at hand, and enabled to devote my whole attention to Natural History. On the contrary, I was compelled to do everything; I was alike leader of the party and bullock driver, and I had to load and unload three beasts of burthen, often several times in the day. All the cares of such a position were laid upon me; mine were the anxieties during the hour of difficulty and peril. To arrange our camp, deal out provision, kill the bullocks, and mend the harness, to compile the log and day-book of our route, to determine the latitude and longitude, and to keep nightly watch, all these various and ever-recurring occupations devolved upon me. Thus, even allowing that I did my very best, it is undeniable that a man, whose attention was less divided, could have effected infinitely more in any one department than I did. Gladly would I have made drawings of my plants, and noted fully all particulars of the different species which I saw; and how valuable would such memoranda have been, when the time arrived which compelled me to cut open all my fine cases so carefully formed, made of hides, and to make a scanty selection from their contents, throwing the greater part away, through the utter impossibility of carrying them on, four of my pack-horses having been drowned. Botanical and geological specimens thus abandoned — how disappointing! From four to five thousand plants were thus sacrificed.

Leichhardt's attempt to cross Australia from east to west began in October 1846 with a completely different party from that which had made the successful crossing to Port Essington. This expedition was intended to be 'a famous one for botany' (Leichhardt 1846), but in the event became bogged down by rain, mud, sickness and the constant need for the party of just nine men to care for and drove the incredible array[15] of livestock which accompanied them. The extent of Leichhardt's botanical collections from this journey is not known to us although Webster (1980, p. 104, 113) makes several references to collections by both Leichhardt and Daniel Bunce, predominantly in the early days of the expedition. The expedition was aborted in July 1847 after nine months of misery.

In March 1848 Leichhardt with six or seven new party members and less livestock[16] commenced his second attempt at an east-west crossing of Australia. Neither he nor his party were ever seen again. With his disappearance went any hope that he could 'sit down with his books and specimens and catch up on his six or eight years of wandering and collecting' as he had written to Durando (Roderick l.c., p.453). It also prevented him from vindicating the support of many of his contemporaries, including William Macarthur of Camden (see introductory quotation).

Despite probably being one of the most competent botanists of his time in Australia, Leichhardt's expertise was lost to science. His failure to publish, the loss of many of his collections, and the fact that his surviving collections went to Paris and Sydney rather than to Hooker all contributed to this. Notwithstanding Hooker's unsympathetic response to his representations, there may well have been numerous names attributable to Leichhardt today had he been offered the job at the Sydney botanic gardens or joined Mitchell's fourth expedition as naturalist. Instead, as far as we can establish, only one of his names has been published: *Tribulus minutus* Leichhardt ex Benth. (Dr Hj. Eichler, pers. comm. 1989). One of his manuscript names can be seen on a specimen of *Sida* in the National Herbarium of Victoria (MEL 53496) collected from Collybluc Mount on 29 March 1843 and there are no doubt others to be found.

Sir Thomas Livingston Mitchell (1792–1855)

A man of great ambition was the Surveyor-General of New South Wales Major Thomas Livingston Mitchell (Cumpston 1954; Foster 1985). In his time, despite disagreements with his superiors, he was feted by the public and in 1839 gained the knighthood he sought. Today he is perhaps commemorated by more monuments than any other Australian explorer. His quest for recognition above that of his contemporaries and predecessors coloured his documentation of his travels. It has even been suggested (Carter 1987) that he renamed features of the landscape when they had been already named by others.

Mitchell organized and participated in four expeditions while in office. His accounts of the first three were published in the two-volume work *Three expeditions to the interior of Australia* (Mitchell 1838, 1839a,b). Prior to leaving for Australia in 1827, Mitchell was often in the company of the geologist Fitton and Robert Brown (Foster l.c., p. 107), from whom he no doubt received encouragement to collect natural history specimens. To ensure the accurate scientific documentation of each expedition he gave the associated collections to leading scientists in Britain while on his visit there in 1837–1838 to arrange publication of the work (Mitchell l.c., preface; Foster l.c.; correspondence[17]). John Lindley, Professor of Botany at the University of London received the rich botanical collections.

Mitchell appears to have collected little of botanical interest on his first expedition to northern New South Wales in 1831–1832. Few plants were reported in the account, and Mitchell does not appear to have appointed a collector. On 13 January 1835 he observed one striking tree, apparently *Owenia acidula*, of which he drew a fruiting branch. Despite its foliage and fruit and its use to the Aborigines being described at some length, the tree is unnamed in the text, indicating that no collection was available to Lindley. In his diary and published journal entries of 17 August 1835, he expressed his regret at not collecting *Capparis mitchellii* during this first expedition. Only two species

were described as new by Lindley, *Calostemma candidum* and *Hibiscus tridactylites* (see table in appendix).

The second expedition in 1835 saw Mitchell appoint an experienced botanist Richard Cunningham, brother of Allan, but he was again fated to produce limited botanical results. Early in the expedition Cunningham became separated from the party, lost his horse and wandered for some days, and was at length killed by Aborigines. No collections made by Cunningham were utilized in the journal; whether any survived is unknown to us. On 13 April, four days prior to his disappearance, 'Mr. Cunningham had a busy day in examining many interesting plants' (Mitchell 1835a,b, 1838, 1839a,b). Seven species were described as new on the expedition, all based upon observations and collections referred to in the journals after Cunningham's death. They were *Panicum laevinode*, *Trigonella suavissima*, *Atriplex halimoides*, *Danthonia lappacea*, *Capparis mitchellii*, *Cassia teretifolia* and *Eleusine marginata*. There is again no indication as to whether anyone assisted Mitchell in collecting these plants. Mitchell's diary in the Mitchell Library shows him to have been not disinterested in the flora. He was conversant with the more common and distinctive genera such as *Casuarina*, the 'pines' or 'cypresses' (*Callitris*), and *Acacia pendula*. He speculated on the use by the Aborigines of the heaps of *Panicum laevinode* 'which extended for miles', and commented at length on *Trigonella suavissima* (1 July: Mitchell 1835a, 1838, 1839a,b):

> the same fragrant trefoil I had seen on the 4th June . . . The perfume of this herb — its freshness and flavour endeared me to try it as a vegetable, and we found it delicious, tender as spinach — and beautifully green when cooked . . . I endeavoured to preserve some of its roots by taking them up in the soil, as the seed (a very small pea) was not ripe.

Mitchell made great efforts to find seed of *Capparis mitchellii*, its fleshy fruit a favourite with the natives. He wrote several times of it in his diary, for example on 18 August 1835:

> This morning as we proceeded I was more successful in my search for seeds of the fruit above mentioned — I was surprised to find many of the trees in the scrub through which we had previously passed without my having observed them there. On one we found some full grown fruit not ripe and on others perfect specimens of last season's fruit including, of course, the seeds — the fruit resembles a small lemon, inside are small nuts or stones . . . in a soft mucilaginous pulp of a pleasing flavour and agreeable perfume — We also found some specimens of the flowers but rather faded.

The final two expeditions were considerably more successful botanically. He again appointed experienced botanists. On his 1836 expedition during which he discovered his luxuriant 'Australia Felix' encompassing the Grampians and surrounding lowlands of western Victoria, he chose the convict John Richardson as 'Collector of Plants' (see later section). Many plants were collected, among them 68 which were described as new by Lindley. Richardson was mentioned specifically only four times in Mitchell's diary, never by name but each time as 'collector': on 17 April 1836 'found several new plants, especially an [Orculis] which was new to the collector', (square brackets his, name added later), on 19 April, on 20 April, and on 23 July on climbing Mt Arapiles ('Mt Last of All' in his diary):

> On its sides grew cypresses — casuarinae, and a variety of shrubs — twelve of which were new to our collector of plants besides three others found about the lakes.

In each instance in the published journal the word 'collector' was replaced by an ambiguous 'we' or similar, so that Richardson's ordained role is mentioned only in the list of personnel on the expedition.

We may never know to what extent each man was involved in the botany of the 1836 expedition, although one suspects that Richardson played the major role. Examination of Lindley's herbarium and any associated papers at Cambridge University may shed light on this. However, it is likely that Richardson supplied Mitchell with many of the names, sometimes incorrect, used in the text, for example *Cupressus australis* (for a *Callitris*) and the two *Acacia* names in this entry in his diary: 'In a strip of scrub consisting of Acacia longifolia — lanceolata and some graceful shrubs . . .'. Nevertheless, Mitchell does demonstrate in his diary an enthusiasm for plants similar to that shown in his previous expeditions. Among the plants he referred to (see table in appendix), he noted his collecting bulbs of *Calostemma carneum* and seeds and flowers of the strange *Gyrostemon pungens*, drew an unnamed *Ranunculus*, and presented crude ideas on the adaptation of the habit to fire of *Eucalyptus dumosa* and 'a prickly bush' (?*Triodia*). Seeds of *Roepera aurantiaca*, *Psoralea cinerea*, and *Picris barbarorum* and bulbs of *Bulbine suavis* were later cultivated in the Chiswick Gardens of the Royal Horticultural Society. The *Bulbine* flowered in May 1838, the *Roepera* in July. The cultivated specimens of the former formed the basis of the description in the *Three expeditions* published shortly after.

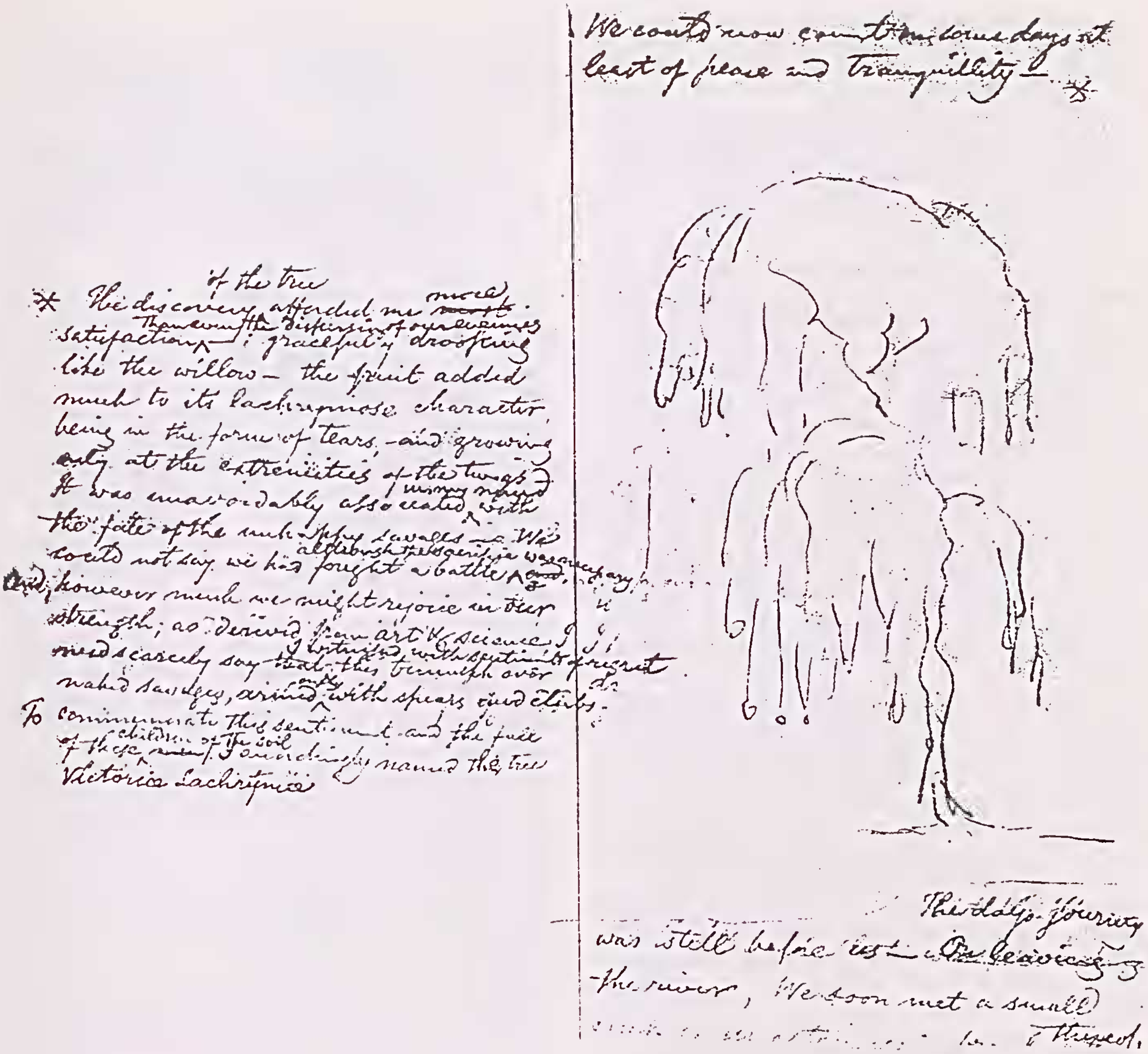
In only four instances was Mitchell involved in the naming of new plants. Of *Pelargonium rodneyanum*, Mitchell (1838, 1839a,b) wrote:

> We also discovered a beautiful new species of the Cape genus *Pelargonium*, which would be an aequisition at our gardens. I named it *P. Rodneyanum* [and added in the second edition] in honour of Mrs. Riddell at Sydney, grand-daughter of the famous Rodney.

None of this appeared in his diary entry of 21 June 1836. Similarly, none of the lengthy description of the plant Mitchell provisionally named *Cassia heteroloba*, if new, appeared in his diary. It is possible that this occurred in a separate field book, possibly assembled by Richardson or with his help.

In the third instance Mitchell named and described a new genus and species, apparently independently (Fig. 3). It was the false sandalwood, a plant of great significance to him. Mitchell saw this small tree several times on the plains about the River Murray. A stand was observed on the day his party was attacked by Aborigines.[18] Mitchell chose to give the plant a new name (Mitchell's 1836 diary, Mitchell Library; Fig. 3):

> The discovery of the tree afforded me more satisfaction than even the dispersion of our enemies — gracefully drooping like the willow — the fruit added much to its lachrymose character being in the form of tears, and



Eucarya Murrayana (mihi).

Fig. 3. a—The extract from Mitchell's diary entry of 27 May 1836, in which he sketched the habit of the false sandalwood and arrived at the name 'Victoria lachrymia' for it. The name commemorated his future Queen and expressed his remorse at the death of Aborigines at the hands of his men on that same day. The fruit illustrated in the publication was sketched on another page of the diary. (Mitchell 1836, from microfilm frame 50A, courtesy of the Mitchell Library). **b**—The published engraving of the plant in his *Three expeditions*... (Mitchell 1838).

> growing only at the extremities of the twigs — It was unavoidably associated ... with the fate of the unhappy savages. We could not say we had fought a batle although the sacrifice was necessary and, however much we might rejoice in our strength as derived from art & science I need scarcely say that I witnessed with sentiments of regret this triumph over naked savagery, armed only with spears and clubs. To commemorate this sentiment and the fall of these children of the soil I accordingly named the tree Victoria lachrymia.

In his published account Mitchell (1838, 1839a,b) changed his choice of 'Victoria lachrymia' for the tree, for soon after his arrival in London in July 1837 to finalize his publication Lindley had published on *Victoria regia*[19] which he had named after the newly crowned Queen. A series of changes to names appearing in Mitchell's diaries may have resulted directly from this. The Rodney Range became the Victoria Range, which in turn may have led to the naming of *Pelargonium rodneyanum*. The second edition saw Mitchell even reapply his epithet 'lachrymia'. An illustration, presumably his, of an unnamed tree ends the account of the 1835 expedition in the first edition. In the second edition, despite no reference to the tree occurring in the text, the name *Eucalyptus lachrymosa* has been added, presumably by Mitchell (see table in appendix, note b).

To completely alter his new tree's name by removing reference both to Victoria and to the clash with the Aborigines was surely politic: it may have seemed expedient at the time to associate a Princess with tearful remorse for the consequences of sacrifices for the realm, but, with his prospects for knighthood diminished by his handling of the conflict at Mt Dispersion (Foster 1985) and the Princess now a monarch, it would not have been very tactful for one seeking the highest rewards from his country. His published name *Eucarya murrayana* represents the establishment of a new genus as well as a new species (but see note 'm' in the appendix). The generic name referred presumably to the fruit's well-developed nut (Black 1948), while he commemorated in the species epithet his major patron (Foster 1985), Sir George Murray, the Colonial Secretary in London in 1828–1830.

Some botanists in the past have considered that Mitchell's publication of *Eucarya murrayana* was inadequate at least in relation to the genus *Eucarya* (Sprague & Summerhayes 1927; Pilger 1935; J. J. Swart in Farr *et al.* 1979). Those who have accepted the generic name as published in the *Three expeditions* are surely correct (e.g. Gardner 1929; Black 1948; Airy Shaw 1973; George 1984). Not only did he provide a full botanical name, which unlike all other such names in his published journal he attributed to himself ('mihi'), but Mitchell also gave a brief description, which included a diagnostic statement comparing it to the quandang (*Fusanus acuminatus*, now *Santalum acuminatum*), and provided a relatively accurate illustration of the habit of the tree, its foliage and fruit (taken from his sketches in his diary). He clearly intended to publish the name. Nevertheless, in view of the comparisons with the quandang, it is likely that Mitchell sought advice on the status of his plant from a botanist, probably Lindley with whom he had much correspondence prior to publishing *Three expeditions*.[20]

Often referred to in the expedition accounts was the quandang. Amongst the frequent correspondence which Mitchell received from Lindley about his plants, Lindley[21] indicated his intention to describe it as a new genus:

> Quandang must be named after its discoverer — & I think I have hit upon a way of getting over the difficulty of there being already the names of Mitchella & Michelia in Botany. Let me make a Mitchellaria. Why not? It's all en règle.

Lindley's genus never eventuated. On 27 November 1837 Lindley wrote that Mitchell had mixed the flowers of a mistletoe ('Loranthus') with the fruiting branches of the quandang in his collections.[22] The quandang had been described much earlier by Robert Brown (1810b) as *Fusanus acuminatus*. The insertion of Brown's *Fusanus acuminatus* in Mitchell's 'Systematical list of the new plants ...' may relate to this misidentification, although Lindley had corrected the error at a very early stage.

Mitchell's fourth and last expedition into inland subtropical Queensland took place between November 1845 and January 1847. His botanist was William Stephenson, 'Surgeon and Collector of objects of Natural History'. Botany is again prominent in the published account of the expedition *Journal of an expedition into the interior of tropical Australia in search of a route from Sydney to the Gulf of Carpentaria* (Mitchell 1848).

Unlike the effective anonymity with which Richardson, and doubtless others, were rewarded, credit is given often to collectors, sometimes by name in this journal. Thus, Mitchell prefaced a long list of plants, which included 16 new species, with (p. 359):

> Mr. Drysdale, the storekeeper, had collected an herbarium during the long sojourn of the party at that camp, which included many new plants.

On 31 August 'we found a plateau of flowering shrubs, chiefly new and strange, so that Mr. Stephenson was soon loaded like a market gardener'. On 6 October, Stephenson and the party of men left back at camp were each credited with collecting listed sets of plants. On 10 October on Mt Faraday, 'Mr. Stephenson was with me, and found some new plants and insects, while I ascertained the height by barometer ...' while later that day, 'Many beautiful shrubs were now beginning to bloom ... Mr. Stephenson and I had been so busy collecting these on our way back, that we only reached the camp at sunset'. On 13 October 'On Mount Owen Mr. Stephenson found a new species of *Vigna* with yellow flowers [*V. lanceolata* Benth.] ...'.

Among the many plants collected were 141 described as new species. Lindley arranged to divide the collections between himself and three others (Foster 1985). Of the families with new species, apparently George Bentham dealt with the Leguminosae, Labiatae, and Myoporaceae, and Professor William Hendrick de Vriese of Leiden investigated the Goodeniaceae, while Lindley and W. J. Hooker of Kew worked up the remainder.

Mitchell again named a new genus of plants. *Delabechea* was a remarkable bottle-tree in the family Sterculiaceae (Fig. 4). On this occasion, however, Lindley described the genus and discussed its relation-

Fig. 4. Mitchell's curious *Delabechea*, now known as *Brachychiton rupestre*. From a drawing by his second in command Edmund Kennedy.

ships at length; it is today recognized as a section of *Brachychiton* (Guymer 1988). Mitchell named the plant 'after Sir Henry T. De la Beche, as president of a Society which has greatly encouraged him in his Australian researches . . .'. De la Beche was President of the Geological Society of London around that time (*Chambers encyclopaedia* 1896; *Encyclopaedia brittanica* 1958).

It is evident that Mitchell had gradually learnt from his previous expeditions and the various botanists he met of the rewards to be reaped from making good collections. This last work shows an awareness of the value of making large collections from a particular region, enabling a description of the floristic composition of its different habitats, while at the same time encompassing any novelties which might occur.

William Swainson (1789–1855)

While the failure to publish their botanical findings has led to many of the collectors of Australian plants not being given justifiable recognition there is perhaps one case where the botanical community should be appreciative of the lack of publication. William Swainson, more usually a zoologist[23] than a botanist, was appointed by Lieutenant-Governor Latrobe in 1852 to report on the timber of the colony of Victoria, particularly the genera *Eucalyptus* and *Casuarina* (Galloway 1978). That report was tabled in November 1853 and within it Swainson claims to have discovered within Eucalyptidae 'five distinct and well-marked genera, hitherto unknown as such, and apparently peculiar to Victoria; together with two other new genera, which occur also in the adjacent province'. His grand total of species and varieties was 1520: 'even if two-thirds may hereafter prove varieties only, there will yet remain more than 500 species, botanically distinct, only two or three of which I have found in New South Wales' (Swainson 1853). Swainson had earlier claimed in a letter to the Colonial Secretary of New South Wales (reproduced in Galloway l.c.) that 'in the Illawarra district alone, generally considered very poor in 'Gum trees' I have already discovered and determined more than 50 species of which dissections etc. have been made'.

Of *Casuarina*, Swainson (l.c.) claimed that 'all the descriptions now existing were perfectly and essentially defective, and therefore quite useless'. He attached a list of all of the species he had found claiming that 'Of all those named in the list I possess elaborate descriptions, partly written with the trees before me'. In a note attached to the 213 species listed, he regretted that he had to leave some species unnamed, although described. The lack of any books to refer to had led to an exhaustion of all the specific names he could think of that might be appropriate!

Continuing, he declared: 'As there exists no scientific society or other medium for publishing an essay on these trees in Melbourne, I think the Royal Tasmanian Society (of which I am an honorary member) will gladly do so in their own transactions'.

Presumably the Royal Society of Tasmania was not appreciative of Swainson's efforts as this work was never published. W. J. Hooker reproduced the report in his *Journal of botany and Kew Garden miscellany* referring to it as a 'singular document' which is 'startling in some of its statements' (W. J. Hooker 1854). Privately he wrote to Mueller:

> I cannot say that I gave to our Secretary for the Colonies an equally flattering account of Mr Swainson on the Gum Trees!!! In my life I think I never read such a series of trash and nonsense. There is a man who left this country with the character of a first rate naturalist (though with many eccentricities) and of a very first-rate Natural History artist and he goes to Australia and takes up the subject of Botany, of which he is as ignorant as a goose.[24]

Maiden (1901) described Swainson's efforts as 'an exhibition of reckless species-making that, as far as I know stands unparalleled in the annals of botanical literature'.

III. Documentation of the Australian flora in Australia by Australians

A. Introduction

We have dealt above with selected examples of people collecting plants in Australia, recognizing novelties and sometimes supplying manuscript names for them. As we have seen, the specimens invariably found their way back to Europe, usually England, where those found or confirmed to be new were named by the celebrated botanists of the day, principally Robert Brown, John Lindley and W. J. Hooker. The extent to which manuscript names have been ignored is unclear, but in most cases acknowledgement of authorship of the collectors was a hit and miss affair. Thus, if Hooker chose to publish a letter within his journals and if the letter happened to contain a binomial with an adequate description, the name has the same nomenclatural standing today as any of Hooker's more formally treated novelties. There were numerous descriptions without accompanying binomials within Gunn and Drummond's letters, which, despite references to their novelty, have no taxonomic standing today.

The reasons for the dearth of publication by Australian residents are several. Among them were their

conditions of employment, little access to the botanical works of the day, lack of an authentically named Australian reference herbarium, and lack of an accessible means of publication.

Except for the establishment and maintenance of gardens and introduced crops, priority for employment of natural history specialists within the Australian colonies would have been low. Energies must have been channelled into activities which helped to make the small, isolated and struggling settlements self supporting. With the nucleus of educated people very small, the collection of natural history specimens by residents was mainly for financial gain. Most botanical collections ended up in gardens rather than herbaria. The collectors of herbarium specimens were supported from outside the colony or by other means. Baxter, Caley and Allan Cunningham were paid a wage from employers in England. Drummond supported himself to some extent by the sale to Europe of seeds and duplicated sets of dried specimens, but also farmed substantial acres, while Gunn and Backhouse had other occupations, but had sufficient means to have spare time to collect. Paterson and Mitchell were both government employees. Leichhardt was privately sponsored, but partly defrayed his costs by selling specimens.

There was no vehicle for publication of novelties within the colonies, except in local newspapers. One exception was Allan Cunningham's (1825) account of plants of the mountains behind Sydney, published in Barron Field's *Geographical memoirs of New South Wales*, but even this was published in London. Scientific societies did not really exist until the 1850s, although numerous attempts had been made to start them from as early as the 1820s (Hoare 1981; Moyal 1986). The bulk of the papers in Field's volume had been presented to the short-lived Philosophical Society of Australasia formed in 1821. The Society was so exclusive that Cunningham was not invited to join it (Finney 1984). It was wound up in 1822. In contrast, Gunn figured prominently in the Tasmanian Society (1838–1848) (Burns & Skemp 1961); he was its secretary from 1840 and the editor of its publication *The Tasmanian journal of natural science.*

In these early colonial times there were no accessible private or public botanical libraries or herbaria. Gunn and Drummond acquired personal copies of some literature from Hooker in exchange for their specimens. Those more botanically educated collectors built up their own private herbaria, supplemented by others they encouraged to collect for them, but very much regional in their scope. These collectors could not be sure that a plant new to them was new to science. When enquiring of W. J. Hooker whether *Melaleuca leakei* had been published by Ludwig Preiss, Drummond (1843, p. 168) commented:

> I send you a species of *Melaleuca*, named *M. leakei* by Mr Preiss, upon which Mr Leake particularly desires your opinion, as to whether it has hitherto been undescribed; since Mr Preiss's situation in this colony rendered it difficult for him to ascertain positively whether a plant was new, or has been discovered previously by British botanists.

The scientific standing of the early Australian resident botanists was accordingly such that they were reliant on members of the established scientific community in England. With the social attitudes of the day, no results of their collecting could be said to have been their own.

B. The Muellerian era of Australian systematic botany

> *Colonial experts, familiar with a distinctive environment and achieving a growing mastery over their own data, became anxious to put their knowledge to systematic and deductive use and were increasingly less willing to serve as the amanuenses of British science.* (Moyal 1986, p. 149).

Not until Ferdinand Mueller took over W. J. Hooker's influence over Australian botany were works published in Australia. His arrival on Australian shores, collecting before he even left the ship (Womersley & Sinkora 1987), coincided with the rising in consciousness of the Australian identity (Moyal 1986) and marked the birth of a new era in Australian systematic botany.

There have been several biographies of Mueller (Willis 1949; Kynaston 1981; also Willis and Short, this volume), and we need refer only to pertinent points of his life. Mueller shared many of the academic qualities seen in the tragically shortened scientific career of Ludwig Leichhardt. Mueller, too, botanized extensively in his first years in South Australia and Victoria, journeying on occasions for hundreds of miles on horseback. He participated in Augustus Gregory's North Australian Expedition from the Victoria River and Arnhem Land to Brisbane in 1855–1856 (Gregory & Gregory 1884; Birman 1979). Unlike Leichhardt, Mueller published the results of his explorations immediately on his return. He confined himself largely to botany. Accordingly, his activities were not spread so thinly as Leichhardt's who tried to encompass the entire natural world.

Mueller built up a massive herbarium, initially through his own collections. He encouraged much botanising by others, as a supporter of exploring expeditions or by contact with resident Australians in every state. By the exchange of material with botanists overseas he was able to build up a named world collection of plants. His exchange collections, which abound in the older overseas herbaria, enhanced studies by overseas botanists on Australian plants. Mueller also accumulated a large botanical library.

Mueller's output of publications was immense, ranging from checklists of collections from expeditions to monographs of *Eucalyptus*, *Acacia* and the Chenopodiaceae, and from two censuses of Australian plants to a Flora of Victoria. He began in 1850 with contributions to overseas journals (Churchill *et al.* 1978). Later he used Victorian parliamentary reports and journals such as *Chemist and druggist of Australasia*, which reflected his initial training in pharmacy. His ambition to produce a Flora of Australia saw the commencement of his (Mueller 1858–1882) large 12 volume, 92 fascicle series *Fragmenta phytographiae Australiae*, which included many new species, described as he received or collected material, and his changing concepts of various plant groups. However, Hooker wisely saw the need for a British-based Flora of Australia. The important material upon which the bulk of published Australian names were based was in

Europe, particularly at Kew and the British Museum. Although Mueller disagreed that the project needed to be carried out in Britain, he collaborated with the chosen author, George Bentham, by sending much of his herbarium with its accompanying annotations to London.

To a large extent Mueller took over the patronising role in the documentation of the Australian flora that British botanists, particularly Joseph Banks and then W. J. Hooker, had played before his arrival on the continent. Unlike most of his predecessors he used considerable first-hand field knowledge to form his own opinions about the plants. His publications on the Australian flora were largely without Australian collaborators. It was only very late in his long botanical life that he published with botanists in the other states, such as J. H. Maiden and Ralph Tate. The help he gained from British colleagues such as the Hookers, however, may have been underestimated. J. D. Hooker wrote repeatedly (Kynaston 1981, pp. 140, 152ff) of his problems comparing Mueller's difficult manuscripts and fragments with the large body of literature and herbarium material at Kew, pointing out to Mueller that:

> ... no one who has not worked in a great library and Herbarium, has any conception of the amount of labour and time lost in approaching completeness and accuracy in descriptive botany.

The former British mentors were thus demoted to answering his queries. J. D. Hooker wrote (Moyal 1986, p. 150):

> ... I observe that the consultation & reference to your fragments have cost Mr Black and myself more labour than the work of any other Botanist whatever.

C. Consolidation after Mueller

Mueller's death in 1896 after 50 years of dominance and productivity in Australian systematics left a void. Bentham's (1863–1878) *Flora australiensis* remained the definitive work on Australian plants for years. After such a 'critical general flora' comes a 'decentralization phase' (Jacobs 1972), with the production of regional floras. This period of Australian plant systematics warrants investigation for a separate review. The few botanists in each state were involved in floristic works (reviewed by George 1981b); floras were produced for South Australia, Tasmania, Northern Territory, Victoria and Queensland, and censuses for Western Australia and New South Wales. Mueller had produced some monographs and censuses, and a few resident botanists did likewise. Sydney was a centre of monographic work. Maiden (1903–1933) and Blakely (1934) effectively monographed *Eucalyptus*, Blakely (1922–1925) the Australian loranthoid mistletoes, and R. H. Anderson (1923) *Sclerolaena* (then known as *Bassia*). The orchids were the subject of special study by Nicholls, Rupp, Rogers and others.

One notable omission from the floristic accounts of the day was consideration of monographic work by continental European botanists (Hj. Eichler, pers. comm.; Barker 1982, p. 93). The reasons for ignoring the species described in revisions of *Euphrasia*, Stackhousiaceae, *Epilobium*, *Plantago* and *Blennodia* are not clear. At least the first two were based on material in continental European herbaria only, with no reference to the important holdings at Kew and the British Museum. Perhaps Australian botanists held the same views that Hooker had expressed to Mueller, that the sound treatment of the Australian flora required reference to these old British collections. The links which Mueller had established widely on the continent were presumably severed with his death. The remaining and coming botanists had the more traditional ethnic links with Britain. The reliance on their British counterparts for taxonomic judgements continued (e.g. a request concerning Santalaceae: Sprague and Summerhayes 1927). This was a time of distrust between nations which led to the two World Wars. Factionalism between national groups of plant taxonomists apparently developed over nomenclatural issues (see Britten 1904, and other papers in the *Journal of botany*). These factions resulted from the debates at the turn of the Century concerning changes to the 1867 Paris version of the *International code of botanical nomenclature*.

Since the 1950s, with the coordinated moves among Australian botanists for a new Flora of Australia (George 1981b), and particularly with the sudden burst of public and political awareness of conservation issues in the early 1970s, Australian plant systematics has entered a new vigorous and independent phase. Flora production on a regional, state and national basis and monographic work go on in tandem. The traditional links with British herbaria will always be maintained. So important are their collections that an Australian botanist is appointed to Kew annually to answer questions from his colleagues in Australia. Research is very much an international activity, however. Through the possibility of overseas visits, loans of specimens, and microfiche photographs of those herbaria that cannot be loaned, revisional study can now be undertaken in Australia without any of the shortcomings expressed by Hooker to Mueller.

IV. Plant collectors overstated and overlooked

> *It shows how credit is always given to the person who is the leader . . . all others being thrown in the shade even if they happen to be more deserving.* (John Roper of Ludwig Leichhardt[25])

The previous sections have highlighted the role of many people in the naming of Australian plants. This section deals with a selection of the early plant collectors, some already mentioned. Seldom did Australia's early publicized plant collectors act on their own. Often their companions deserved as much credit for the collection. It has been noted already that Robert Brown's herbarium of Australian plants incorporated his assistant Peter Good's without any note to that effect (Edwards 1981; Clarkson 1988). In a similar way many of Ronald Gunn's collections were made by other people (see Buchanan 1988, this volume).

Government expeditions were run on military lines with a requirement that the leader keep a day-to-day record of observations and events and collect items of natural history. At the end of the journey all journals and curiosities collected by members of the expedition were to be turned over to the leader. Little wonder then that collections made were attributed to him. Even the officers were not always credited with their specimens.

All accolades went to the leader with his monopoly on publication. Publication of competing journals of the expedition by other members of the party would probably have been seen as a waste of time once the 'official' version had been published. Any conflicting comments made by the largely uneducated 'men' of the party would have been either seen as in bad taste by the establishment or ignored.

We perpetuate this lack of recognition of the actual collectors by assigning specimens to the leader of an expedition, rather than to his 'herbarium'. However, with the passage of time it is unlikely that we can establish the true gatherers of particular plants.

A. The Aborigines

The extent to which Aborigines played a role in guiding many collectors to plants needs investigation. Most explorers included Aborigines in their party, and they would no doubt have been important in the discovery of plants even in regions beyond their homeland. In his translation of Leichhardt's diary of his visit to the Bunya Bunya Mountains, Roderick (1988, p. 215) wrote of him:

> Nicky and another lad ... took him on botanical excursions, climbing trees to secure leaves and fruits, accompanied sometimes by an ancient whose native name was Burbello ... Forgotten men now, gone like the leaves of the forest; but eager and anxious then to please this tall friendly visitor from another world. 'With what slender means', he ruminated, 'can a naturalist in this neighbourhood achieve with the help of the blacks ... If I were sure of support I would spend a year here and live as much as possible with the blacks.'

In contrast Mitchell's party in Australia Felix was not on such good terms with the Aborigines. The second in command Stapylton wrote on 28 July 1836 about the loss of his faithful dog Smut, assumed to have been killed by an aborigine (Andrews 1986):

> I am confident he has been barburously murdered by one villain whom I could name in this party This is A little too bad but it is exactly what I expected would take place under such A system of toleration towards such wretches Black fellow shot at and wounded to day by one of the men in the Bush — Native shipped his spear and was accordingly very properly fired at now for war with these Gentry I suppose[.] they are encamped around us tonight tomorrow will give them A Benefit if they dont keep of — Piper [Mitchell's aboriginal interpreter] carries A Pair of Handcuffs slung round him as one must be taken Prisoner for the sake of obtaining native names of Places ...

B. Convicts, the often anonymous collectors

While we have already seen that the collection of natural history items was one of the few ways that convicts could benefit financially, it seems that convicts may well have been the real collectors on some of the early explorations.

Soon after his arrival at Port Jackson in 1817, Allan Cunningham trained a convict servant to collect plants (McMinn 1970). This anonymous person collected without Cunningham at Illawarra in 1826. Similarly, in 1824 Cunningham left instructions for other servants to make botanical journeys while he was absent at Port Macquarie. These collections are presumably represented somewhere within Cunningham's vast herbarium.

George Caley, when collecting in 1801 on James Grant's voyage of exploration down the south coast, was given special assistance by Governor King. King ordered Grant to aid Caley as much as possible 'by sparing him men for his assistance, exclusive of a soldier who is always to attend him on shore' (Currey 1967). Governor King may have thought that through this gesture he had the right to demand that all journals, drawings and collections 'worthy of notice of His Majesty's ministers or the Royal Society' be given to him for transmission to England. We have seen Caley's reaction to this previously.

It is known that William Baxter had the services of a convict when he visited King Georges Sound in 1829. In a letter reproduced by Maiden (1909), Lieutenant Sleeman at King Georges Sound wrote on 25 March 1829:

> I had the best vacant hut on the settlement prepared for Mr Baxter (Botanist) when he landed, and in order to contribute to his personal comfort as well as to enable him to proceed with more expedition in collecting and preserving the most valuable seeds and plants in this neighbourhood, I gave him the exclusive services of one of the most useful of the Crown prisoners, who attends him on all of his botanizing perambulations.

Baxter had sought the cooperation of the colonial government on his 1829 expedition. In return for a passage to King Georges Sound, the provision of collecting items and a regular ration, Baxter had offered half of his collections to the Sydney Botanic Gardens. On his return to Sydney, however, Charles Fraser, then Colonial Botanist, had to have the garden's half forcibly removed from the ship. It may have been this incident which accounts for the attribution of a collection of *Hakea denticulata* R. Br. in the Graham Herbarium in Edinburgh to Charles Fraser. The collector was almost certainly William Baxter, which affects the type status of the specimen (R. M. Barker, unpublished).

The convict John Richardson (?1797–1882)

John Richardson, the convict botanical collector, is almost unknown because of his status. A brief biographical sketch is provided from accounts in the *Australian dictionary of biography* and Andrews (1986).

Richardson, a nurseryman of Horsham, Sussex, was sentenced to seven years' transportation for larceny in March 1816. He arrived in Sydney in September 1817 and was presumably assigned to work in the government gardens. In 1821 'John Richardson, now a free man by absolute pardon, a gardener by profession ... [was] sent home in charge of a collection of Plants and Seeds of Australia on board the Dromedary'. In March 1822 Richardson was sentenced to death for housebreaking, his sentence being remitted to transportation for life. He arrived back in Australia, at Hobart Town, in November 1822 and was assigned work as a gardener. In May 1823, following a request from Charles Fraser, Colonial Botanist, he was able to accompany Fraser back to Sydney to become an overseer at the government gardens. Between 1823 and February 1826 his activities are obscure but it is possible that he spent some of the time on Oxley's surveying expeditions to the north of Sydney. In seeking a pardon for Richardson after the successful 1836 expe-

dition (this must have been at least his second pardon, ignoring the number of tickets of leave), Mitchell (Andrews l.c.) referred to 'his long service in the cause of science, he having also accompanied Mr Oxley'. Support for this is given by the fact that Richardson supplied seed of *Hibiscus richardsonii* from Port Macquarie to Colvills nursery before 1825. The plant was named after him by Lindley (1825). Similarly, *Alyxia richardsonii* (now *Alyxia ruscifolia* R. Br. of northeastern Australia) was named by Sweet (1827–1828) and recorded as being introduced from New Holland in 1823. In 1824 Richardson may also have accompanied William Baxter to King Georges Sound (R. Grandison, pers. comm. 1989).

In February 1826 Richardson was sent to Melville Island in charge of the garden for the new settlement to be made at Port Essington. In August 1826 he accompanied the *Mermaid* to Timor for a supply of seeds. With the failure of the settlement in 1829 he returned to Sydney on board the *Lucy Anne*, the government ship which picked up William Baxter's collection of seeds and plants from King Georges Sound (see previous section).

Having been granted a ticket of leave for Sydney on his return, Richardson fell on hard times. His wife died in 1830 and he continued to be in trouble until 1831 when his ticket of leave was revoked. He was then assigned to A. B. Spark of Cooks River. From this period until he was assigned to Mitchell's third expedition in 1836, nothing is known. We have already noted the anonymity which Mitchell accorded Richardson on this expedition. That he was 'indefatigable' on Mitchell's expedition, 'although an old man' (at the age of 39!), led to Mitchell recommending his conditional pardon (Andrews l.c.). Richardson eventually moved to Singleton, where he remarried and presumably mended his ways. He lived until the age of 85 but whether he continued to collect plants is not known to us.

C. James Drummond and his companion collectors

That James Drummond was not the only collector in his family has already been alluded to. His children took a keen interest in the plants of their area and in some cases were the first to recognize new taxa.

On most of his collecting trips James Drummond was accompanied by other people (Erickson 1975). His second collection in 1842–1843 was made in the company of the ornithologist John Gilbert, who presumably collected under his own name. His third expedition of 1843–1844 was undertaken with his son Johnston who, as we have already seen, at times independently collected and recognized plants, but there is no indication of this in Drummond's collections. The fourth collection to the 'South Coast' and the Stirling Ranges was made with George Maxwell. While Maxwell later made copious collections in his own name, many of which were sent to Mueller in Melbourne, it needs to be investigated whether his personal collections encompass the time spent with Drummond in 1847 or whether Drummond merely included Maxwell's collections under his own. Erickson (l.c.) states that this trip with Drummond was Maxwell's training ground. However, there is at least one, and presumably more, Maxwell collection from as early as 1838.[26]

D. Collectors on expeditions of discovery in Australia

Government sponsored exploring expeditions were provided with sets of instructions to their leaders (Gilbert 1986). A set of these instructions was relayed to Governor Macquarie in 1816 by the Secretary of State for the Colonies, Earl Bathurst. Amongst the requirements listed was a journal detailing observations and occurrences, however minute. Attention was to be paid to the animal, vegetable and mineral productions, with especial care to look for plants of any potential economic importance. Specimens of the most remarkable plants, animals and minerals were to be preserved, while seed collections were to be made of any unknown plants. Similar, at times word for word, orders were given by Governors Darling and Grey to Charles Sturt (Langley 1969), while, as already noted, Governor King had given similar instructions to James Grant in 1801.

One further significant instruction was the order, as, for example given to Sturt (Langley 1969), that at the end of the journey the leader was:

> to cause all the journals or other documents belonging to, and curiosities collected by, the several individuals comprising the expedition, to be carefully sealed up with your own seal and kept in that state until you shall have made your report ... in writing of the results of the expedition.

One recently discovered journal which escaped this monopoly of ownership of expedition journals, purportedly by being stitched inside an overcoat (Langley 1969), was that of Daniel Brock (Brock 1975) of the 1844–1845 expedition with Charles Sturt. It provides an at times damning insight into these arduous journeys from the point of view of one not in authority.

The exploring expeditions of the 1800s had a few officers or leaders of higher social status together with a larger number of men of lower status acting as personal servants, shepherds, blacksmiths, bullock drivers etc. Convicts often filled some of these latter roles. Mitchell preferred convicts to free men, even when the latter offered to participate without pay; 'the prospect of either liberty or reduction in sentence impelled them to render most satisfactory service' (Foster 1985, p. 373). The powers of the leaders were such that men could be discharged without pay at the end of months of hardship. John Mack the bullock-driver on Sturt's third expedition (Brock 1975), and Müller and Smith on John McDouall Stuart's third expedition were dismissed without pay because of disputes with their leaders (Stuart 1865).

In camp the officers ate and slept separately from the men. The bird-skinner Daniel Brock's description of making camp on Charles Sturt's 1844 expedition sheds light on the relationship between the two groups (Brock 1975):

> It would perhaps be well if I state how matters are arranged in our drawing into camp at night ... Some time before the day's journey is completed, the horsemen ride ahead, when a convenient place is chosen. When we come up, the first thing we observe are the horses unsaddled and tethered. In the distance under a gum tree will be seen reclining Sturt, Poole and the Doctor. We draw up the drays so as to form a square, near to fallen timber for our fire. The bullocks are unyoked, and away they go, the drivers arranging their yokes for the morrow's start. The

Table IX
Known plant collectors on some of the exploring expeditions of the 1800s into the interior of Australia*

Expedition	Expedition designation	Date	Collectors	Party	General itinerary
Oxley	—	Apr.-Aug. 1817	A. Cunningham, C. Fraser	13	Lachlan and Maequarie Rivers, New South Wales
	—	May-Nov. 1818 1818	C. Fraser	?	Liverpool Plains, New South Wales
Mitchell	1st	Nov. 1831-28 Feb. 1832	?T. L. Mitchell	18	Namoi River region, New South Wales
	2nd	9 Mar.-mid Sept. 1835	R. Cunningham, T. L. Mitchell	23	Darling River, New South Wales
	3rd	e. Feb.-3 Nov. 1836	J. Richardson, T. L. Mitchell	25	Western Victoria ('Australia Felix')
	4th	1 Nov. 1845 -20 Jan. 1847	W. Stephenson, J. W. Drysdale, T. L. Mitchell, others ('the party of men')	29	Eastern interior of Queensland
Sturt	1st	Nov. 1828-Mar. 1829	?	13	Darling River, New South Wales
	2nd	Sept. 1829-May 1830	G. MacLeay, C. Sturt	?8	Murray River
	3rd	June 1844-Jan. 1846	D. Brock, W. Lewis, Sullivan, Dr J. H. Browne	17	Inland eastern South Australia
Babbage	—	1858	D. Hergott	?	Lake Eyre region, South Australia
Leichhardt	1st	Aug. 1844-Dec. 1845	L. Leichhardt, J. Gilbert, the party in general	8	Moreton Bay (Brisbane) to Port Essington (north of present Darwin)
	2nd	Oct. 1846-July 1847	L. Leichhardt, D. Bunce	9	Abortive trip from Moreton Bay, Queensland, to Perth, Western Australia
	3rd	Feb.1848-	?	7/8	As above; never seen again
Stuart	1st	May-Sept. 1858	Possibly no collections	3	Lake Gairdner-Lake Torrens area, South Australia
	2nd	Apr.-July 1859	D. Hergott, ?L. Müller	4	Lake Torrens area, South Australia
	3rd	Nov. 1859-Jan. 1860	W. Kekwick, ?L. Müller; others ('we')	5	Lake Torrens area, South Australia
	4th	Mar.-Sept. 1860	W. Kekwick; others ('we')	3	Chambers Creek to West Neales to MacDonnell Ranges to Central Mt Stu(a)rt (centre of continent)
	5th	[?Nov.1860/ Jan. 1861]-Sept. 1861	W. Kekwick; others ('we')	10	Chambers Creek to James Range to MacDonnell Ranges to Tennant Creek to Newcastle Waters (abortive crossing of continent)
	6th	Dec. 1861-Dec. 1862	F. G. Waterhouse, W. Kekwick, J. Frew	10	As above to Newcastle Waters, then to Van Diemen Gulf, east of present Darwin
Giles	1st	4 Aug. 1872-31 Jan. 1873	E. Giles	3	Chambers Pillar, Ehrenberg Mts, central Australia
	2nd	4 Aug. 1873-20 July 1874	E. Giles, ?W. H. Tietkens	4	Central Australia as far as Gibson Desert
	3rd	13 Mar. 1875-6 May 1875	E. Giles	3	Euela to Ooldea, far western South Australia, to Beltana, Flinders Ranges
	4th	23 May 1875-Nov. 1875	E. Giles, W. H. Tietkens, J. Young	6	Port Augusta to Perth via Great Victoria Desert
	5th	18 Nov. 1875-Aug. 1876	E. Giles	5	Perth to Pilbara region to Gibson Desert to Beltana

* It is difficult to know to what extent others, including party leaders such as Mitchell, were involved.

> drays are unlashed, the Captain's marquee is got out, and what spare hands there are turn to and pitch it. While this is doing the two cooks are getting up a fire, getting the dinner under way. After the marquee is pitched there is the Officers' bell tent; that is pitched, and against the camp stools, tables and bedding got in. It gets near time for dinner. If there have been no birds shot, I sometimes have to assist with the marquee, sometimes guarding the sheep.

It would appear that as a general rule if a naturalist or collector was considered one of the officers then his contribution was usually acknowledged on the collections and in the published journal. Thus, on Oxley's 1817 expedition Allan Cunningham and Charles Fraser collected in their own right, as did Richard Cunningham on Mitchell's 1835 second expedition and the surgeon J. W. H. Browne on Sturt's 1844 expedition. Collectors on the various expeditions treated, as far as can be established, are listed in Table IX.

The surgeon William Stephenson

Reference has already been made to William Stephenson's involvement in Mitchell's fourth expedition in 1846 to central Queensland as the party's 'Surgeon, and Collector of objects of Natural History'. Although one of the officers, there is some doubt about due credit being accorded to him as collector. Apparently he was dragged before the courts by Mitchell for withholding botanical and other natural history items (Gilbert 1981), for which he was found not guilty. We have not seen or heard of any collections which have been attributed specifically to any of Mitchell's per-

sonnel on his four expeditions. All Mitchell expedition specimens seen have printed labels bearing only Mitchell's name, or hand written labels with 'Major Mitchells Expedition'. As we have already seen, in his account of the fourth expedition Mitchell occasionally credited Stephenson and others in the party with the collection of specific plants. Yet, in terms of annotating specimens with the collector's name, Stephenson the surgeon appears to have been treated like Richardson the convict.

Collections attributed to Stephenson do occur in herbaria. All seen were made either before or after the Mitchell expedition, often with the printed general locality, 'within 125 miles of Sydney'.

Charles Sturt's expeditions

Captain Charles Sturt (1833) voyaged down the Murrumbidgee and Murray Rivers in 1829–1831. Whether plant collections were made on the journey is unclear from his published account. Reference is made to his second-in-command George McLeay 'who was always indefatigable in his pursuits after subjects of natural history' and to a 'brush, in which there was a new species of melaleuca'. Near the end of the journey the carpenter, Clayton, was directed 'to make some plant cases of the upper planks of the boat', implying that collections had been made. Confirmation of at least one collection is given by Robert Brown (1849) in his appendix to Sturt's later expedition to central Australia (Sturt 1849) where he refers to a collection of *Jasminum lineare* R. Br. from this journey.

On his later expedition in 1844–1845 to central Australia in search of the inland sea which Sturt was convinced existed there, collections of 'about 100' species were made. In briefly introducing the appendix, Robert Brown (l.c.) referred to the collections of Sturt and 'Brown', actually the doctor J. H. Browne. However, Sturt's name alone appears as the collector of most of the about 35 species dealt with in the account. For the remaining species no collector is given.

Examination of another account of this expedition by the bird-skinner Daniel Brock (Brock 1975) reveals that the men, as opposed to the officers, were involved in the collecting at least of seeds. This activity was singled out in the expedition's orders (Langley 1969, p.250):

> It is further expected that you will, as far as may be in your power, attend to the animal, vegetable and mineral productions of the country, noting down everything that may occur to you and preserving specimens as far as your means will permit, especially some of all the ripe seeds that you may discover.

William Lewis, previously a sailor but employed as a bullock driver, Sullivan (no Christian name and not contained in Sturt's list of personnel[27]), assistant to Brock in charge of the sheep, and Brock were all at some time engaged in this activity. It is possible that they collected plants for Sturt. In fact, in listing his party, Sturt refers to Brock as his collector (Sturt l.c.).

There is one instance where the party's collecting activity is referred to in both accounts. On 23 December 1844 Brock's comment is: 'Lewis goes to gather seeds', while Sturt says of the same day: 'The seeds were ripening fast along the banks of the creek, and we collected as many as we could'.

Further notes by Brock on collecting activity are found in the entry for 18 December 1844: 'Lewis, having been out gathering seeds, fell in with us'; for 21 February 1845: 'Mr Poole having given me and Sullivan instructions to push down the creek (east) to procure acacia seeds and also birds (Mr Poole is very anxious to get seeds for some friends of his in 'Ould Ireland' — but this is under the bush) . . .'; for 22 February 1845 'Lewis, being out looking for seeds, . . .'; for 23 February 1845: '[Brock was] engaged in part in looking for seeds'; for 13 March 1845 '[Brock was] busy this morning in gathering seeds'

Ludwig Leichhardt's expeditions

Ludwig Leichhardt's expeditions were sponsored not by the government but privately by landholders and Sydney merchants. The number in the party was much smaller and there was not the same distinction between officers and men as shown in the government expeditions. We have already seen in the previous section Leichhardt's description of his activities while on expedition but the following account reproduced by Roderick (1988, p. 294) seems more balanced. Leichhardt wrote that on rising,

> a loud cooee then rouses my companions, — Brown to make tea, Mr. Calvert to season the stew . . . and myself and the others to wash, and to prepare the breakfast . . . [By the time breakfast is served] Charley generally arrives with the horses, which are then prepared for their day's duty. After breakfast, Charley goes with John Murphy to fetch the bullocks, which are generally brought in a little after seven o'clock A.M. The work of loading follows . . . and, at about a quarter to eight o'clock, we move on and continue travelling four hours, and, if possible, select a spot for our camp . . . As soon as the camp is pitched, and the horses and bullocks unloaded, we have all our allotted duties; to make the fire falls to my share; Brown's duty is to fetch water for tea; and Mr. Calvert weighs out a pound and a-half of flour . . . during the afternoon, every one follows his own pursuits, such as washing and mending clothes, repairing saddles, pack-saddles, and packs; my occupation is to write my log, and lay down my route, or make an excursion in the vicinity of the camp to botanize, &c., or ride out reconnoitring. My companions also write down their remarks, and wander about collecting seeds, or looking for curious pebbles. Mr. Gilbert takes his gun to shoot birds. A loud cooee again unites us towards sunset round our table cloth.

Leichhardt was not the only collector of plants on the Port Essington expedition (Table IX). All three biographers of Leichhardt (Chisholm 1973; Webster 1980; Roderick 1988) mention that John Gilbert and Leichhardt fell out over collections. Their interpretations vary, but it would seem that the undertaking was that bird collections were to go to Gilbert's employer, John Gould, along with the second collection of any quadrupeds. The first collection of any other fauna and plants were to go to the Australian museum with duplicates to Paris or London (Roderick l.c.). According to Webster (1980, p. 385), Gilbert had authority to buy natural history items for Gould and he was also given 10% of sale of specimens which Gould did not want to keep. Roper at least is reputed to have given specimens to Gilbert rather than Leichhardt in the hope of benefiting financially.

As has already been mentioned in the previous section on Leichhardt, Daniel Bunce collected on the aborted east-west crossing. He was keen to accompany Leichhardt on his next expedition as well, but by this time news of Bunce's previously bad character (Roderick l.c., p. 401) had reached Leichhardt, who declined to make Bunce one of his new party. Presumably it was Leichhardt's intention to make his own collections as no collector accompanied this final party.

David Hergott on Babbage's expedition

David Hergott (sometimes 'Herrgott') was the 'General Assistant and Botanist' on B. H. Babbage's expedition to the north-west interior of South Australia in 1858. While Mueller (1859) acknowledged briefly in the introduction to the collection that the herbarium 'was compiled by Mr David Hergolt [sic]' and did 'credit to his skill and industry' no further mention is made of his contribution. Throughout the descriptions reference was made to Babbage's collections! New genera and species were described. Persons commemorated included Kriehauff and Dutton, promoters of the expedition, Governor MacDonnell and his secretary, Paisley, Ronald Gunn, the Tasmanian collector, and Richard Kippist, librarian of the Linnean society. The genus *Babbagea* was named after the expedition leader but, as pointed out by Maiden (1908a), Hergott received no commemoration.

Following Babbage's expedition Hergott joined the second of Stuart's expeditions, discussed below, and then (Anonymous, undated) guided Alexander Tolmer's ill-founded search east of Lake Torrens for a shorter route than Stuart's to the centre of Australia. Tonkin (1985) states that Tolmer had offered to accompany Stuart's third attempt to cross the continent from north to south as second-in-command but when he found that he was being used only to help get the expedition together, he organized his own.

John McDouall Stuart's expeditions

Perusal of John McDouall Stuart's (1865) publication of the journals of his explorations into central Australia from 1858 to 1862 reveal that he was not the only person who collected on his expeditions. It is known that F. G. Waterhouse (initials wrongly cited by Stuart as J. W.) was naturalist on the successful crossing of Australia from south to north between December 1861 and December 1862, his last expedition. In enumerating the plants collected on Stuart's six expeditions in the appendix to this work, Mueller (1865) indicated those which were collected by Waterhouse. The remaining specimens are either attributed to Stuart or have no collector indicated. A search of Mueller's *Fragmenta* produced at this time revealed no acknowledgement of other collectors.

Other people did collect plants for Stuart. During the 1859 second expedition he was accompanied by Hergott, the botanist on Babbage's expedition, and Louis Müller. There is one reference to a botanist: 'I sent Campbell (my stockman) in one direction and Müller (the botanist) in the other'.

We have been unable to find any reference to Louis Müller except for a passing comment (Anonymous, undated, p. 1025) that he was a gold prospector; the search for gold during Stuart's 1859 third expedition when Müller was again present bears this statement out. If any plants were collected, however, and this seems likely as there is a reference to finding new plants in Chambers Creek on 5 May 1859, it is much more likely that the collector would have been Hergott, as he had already acted in this capacity on Babbage's 1858 expedition. The reference to Müller as the botanist may have been a slip by Stuart's London editor in the mistaken belief that the Müller referred to was the better known Ferdinand.

On Stuart's fourth, fifth and sixth expeditions, there is clear reference to William Keekwick as the collector of plants along with less specific statements on general collecting by the party. Thus on 24 April 1860 at Central Mt Stuart there appears the statement that:

> Keekwick returned in the afternoon, having found water higher up the creek. He has also found a new rose of a beautiful description, having thorns on its branches and a seed-vessel resembling a gherkin. It has a sweet, strong perfume; the leaves are white, but as the flower is withered I am unable to describe it.

On the fifth expedition on 28 April 1861 at Tomkinson Creek following the general: 'We have found many new plants and flowers, also some trees' there follows: 'Mr Keekwick, in looking for plants this morning, discovered one which very much resembles wheat in straw (which is very tough), ear and seed.'

Again on the sixth expedition, even though Waterhouse was present as naturalist, we have on 21 June 1862 at the first camp north of the Gorge on River Strangways 'Mr Keekwick still finding new shrubs'; on 14 July 1862 at The Mary, Adelaide River 'We have passed a number of trees resembling the iron-bark, also some like new ones, and many shrubs, which Mr Keekwick has found'; and on 24 June 1862, at Mussel Camp, River Strangways 'Mr Keekwick found cane growing in the bed, and also brought in a specimen of a new water-lily — a most beautiful thing it is; it is now in Mr Waterhouse's collection'.

James Frew, whose occupation in the party was not listed, although Stuart refers to his approval of his care of the horses in naming Frew's Waterhole, also discovered at least one plant. Stuart recorded on 20 June 1862:

> Frew, in looking about the banks, found a large creeper with a yellow blossom, and having a large bean pod growing on it.

Collectors associated with the explorer Ernest Giles

Ernest Giles was sponsored in his earlier expeditions in central Australia by Ferdinand von Mueller and there is no doubt that he collected many plants for Mueller which now reside in the National Herbarium of Victoria. Those plants from Giles's expeditions of special interest, many of them new, were described in detail in the ninth and tenth volumes of Mueller's (1852–1882) *Fragmenta phytographiae Australiae.* In these he referred to collectors and their localities. The five expeditions made by Giles were described in his work (Giles 1889) *Australia twice traversed.* Mueller (1889) summarised the botanical results of the first two expeditions of 1872–1874 in an appendix to the second volume.

All plants from the later expeditions were treated by Mueller (1877) in his 'List of the plants obtained dur-

ing Mr C. Giles's travels in Australia in 1875 and 1876'. The use of 'C.' instead of 'E.' in the title is an obvious slip as the majority of collections came from Ernest Giles and the introduction is devoted almost entirely to him. However, throughout the list there are separate references to 91 collections made by C. Giles. A myth has been perpetuated that Christopher was a brother of Ernest Giles; the earliest reference seen to this is by Maiden (1908a). Furthermore, Christopher is purported to have collected on Ernest's earlier expeditions (Maiden 1908a; Willis 1981; Kraehenbuehl 1986), despite Mueller's inclusion of Christopher's collections with the results of Ernest's last three expeditions.

According to Ericksen (1978) Ernest Giles had one brother named Robert. There appears no evidence that he ever collected plants or visited central Australia. In addition the journals for the expeditions concerned (Giles 1889) make no mention of a collector and Christopher Giles was not listed in either party. Nor did Ernest Giles on these expeditions visit the MacDonnell Ranges or Charlotte Waters, the collecting localities of Christopher Giles. Overlooked has been the fact that Mueller (1877) introduced the list, based as it was mainly upon the collections of Ernest Giles, with the comment that: 'Some plants from small collections secured by other recent explorers are also added'. Ernest Giles (1889) referred to Christopher at one point in his published journal of the first expedition in naming a landmark on 28 August 1872: 'I named it Christopher's Pinnacle after a namesake of mine.' He would surely have referred to him as his brother if it were so.

There is no evidence that Christopher Giles was a relation of Ernest Giles, nor did he ever collect or participate on Ernest's expeditions. Christopher Giles could well have been involved either with the Gosse expedition to central Australia in 1873 or more likely with the surveying of the overland telegraph which took place in the area at that time. Reference is made to the journal of an Alfred Giles who was involved in reconnaissances for the telegraph (Anonymous, undated). He must also have collected for *Bauhinia gilesii* was named after him (Mueller & Bailey in Mueller 1882). Those collections of Christopher Giles which have been seen in the National Herbarium of Victoria have all been dated May 1875.

In keeping with our theme of overlooked collectors, it is ironic that, despite Mueller's (1875) naming the genus *Gilesia* jointly after Christopher and Ernest Giles, subsequent botanical works (e.g. Black 1952; Baines 1981; Jessop 1986; Elliot & Jones 1986) have invariably assumed the genus to have been named after the more eminent of the two. Mueller (1875, translated from the Latin) wrote:

> The name of this new genus has been dedicated to the learned Christopher Giles, discoverer of many central Australian plants and of this very species, as well as to the now renowned geographer Ernest Giles, who also always collected a large number of plants on his arduous explorations.

Another collection included in Mueller's (1877) list is the 61 specimens gathered by 'Lewis' from Lake Eyre. This was presumably John Lewis who led a government expedition to Lake Eyre in 1874–1875 to find out whether its waters were navigable and to explore the nature of the country east and north. The only other collectors mentioned related to single specimens. One from between Eucla and Fowler's Bay was by 'Richards', probably the police trooper referred to by Ernest Giles on his third expedition as guiding Giles in 1875 to Youldeh (Ooldea) from Fowler's Bay. His wife Annie sent Mueller extensive collections from Eyre Peninsula between 1873 and 1894 (Kraehenbuehl 1986). The other collection was by the explorer William Gosse from the Musgrave Ranges.

Although in the introduction to the list of plants from Giles's later expeditions Mueller (1877) stated that Jesse Young and Mr Tietkens formed extensive collections on Giles's fourth expedition (Mueller cited it as the third), he did not indicate which of the collections were attributable to them. Mueller's (1875–1877, vols. 9–10) *Fragmenta* volumes indicate those collections of Young and Tietkens which proved to be new or of particular scientific interest. These collections came to Mueller by way of the expedition sponsor, the pastoralist Sir Thomas Elder (Mueller 1877); the other collections were presumably forwarded by Giles directly to Mueller. Tietkens had also accompanied Giles on his second expedition, but it is not known whether he made any collections on this journey.

Tietkens later led his own expedition in central Australia and plant specimens were again forwarded to Mueller. In Mueller and Tate's (1890) account of the specimens 'collected by Mr Tietkins and his assistants' the identity of these assistants is unknown.

V. Which name to which plant?: history in nomenclature

> *The application of names of taxonomic groups is determined by means of nomenclatural types.* (ICBN, Principle II)
>
> *Each taxonomic group with a particular circumscription, position, and rank can bear only one correct name, the earliest that is in accordance with the Rules, except in specified cases.* (ICBN, Principle IV)

The rules of application of plant names, detailed in the *International Code of botanical nomenclature* (abbreviated to ICBN or *Code*), are greatly involved with history in several areas. Firstly, there is a rule of priority whereby the correct name is usually the earliest published for a particular taxonomic group (a 'taxon'). It is therefore necessary to establish the publication dates of literature, a major function of *Taxonomic literature* (Stafleu & Cowan 1976–1988). Secondly, modern rules of nomenclature require that a 'type' specimen be designated when describing a plant for the first time. A plant name is associated with this particular specimen for all time. Because it has been obligatory that a type be designated only since 1958 (Art. 37), names published prior to that date, particularly from the last century when there was no type concept, have often not had a type designated when published. Accordingly, as part of the process of establishing the names of plants, each old name must have a specimen selected as its type. The determination of the type of a name ('typification') may involve an investigation of who was involved in the provision of the specimens,

the name and the description of the taxon involved. The authorship of a name may be some guide to those involved, but, as will be seen, cannot be taken to encompass all.

A. Typification: a search into the historical background of a name

> *Typification of names for which no holotype was designated should only be carried out with an understanding of the author's method of working . . .*(ICBN, Rec. 7B.2)
>
> *Designation of a lectotype should be undertaken only in the light of an understanding of the group concerned. In choosing a lectotype, all aspects of the protologue should be considered as a basic guide . . .*(ICBN, Rec. 7B.3)
>
> *In choosing a lectotype, any indication of intent by the author of a name should be given preference unless such indication is contrary to the protologue. Such indications are manuscript notes, annotations on herbarium sheets, recognizable figures, and epithets such as typicus, genuinis, vulgaris, communis, etc.* (ICBN, Rec. 7B.4)
>
> *In selecting a neotype particular care and critical knowledge should be exercised, because the reviewer usually has no guide except personal judgement as to what best fits the protologue, and if this selection proves to be faulty, it will inevitably result in further change.* (ICBN, Rec. 7C)

Where there is only a single specimen used or designated by the author as the nomenclatural type, the specimen is called the 'holotype' of the name (Art. 7.3). Where there is no such single specimen, a specimen called the 'lectotype' must be chosen from the material used in the compilation of the description of the taxon (Art. 7.4, 7.5). Such a specimen needs to carefully selected (see text quoted above). Frequently, some knowledge of the botanical activities of the author is required. If no such material exists (it may have been lost or the name may have been based on living material), a substitute specimen or 'neotype' must be chosen (Art. 7.4, 7.9; text quoted above).

As a result of these rules, taxonomists reassessing names should obviously be aware of the source of all information presented in the protologue. In other words, the possibility of unacknowledged contributions to the documentation of plant names should be considered in all typifications. As we have shown, the manuscripts of Solander and Dryander are obviously important to the typification of Robert Brown's Australian names in particular, but to date they will have been rarely consulted in revisional studies. In the interests of more informed typifications, it would be of great benefit to have their manuscripts investigated and microfilmed in the same way as Brown's manuscripts have been (Burbidge 1955).

In the interests of stable nomenclature the *Code* does not allow for a selected type to be superseded unless it is in serious conflict with the protologue (Art. 8). This adds further to the need for care in the initial selection of a lectotype or neotype.

Finally, the *Code* (Rec. 34A; see also Rec. 23B.1.i) recommends against the publication of a previously unpublished manuscript name which is not being taken up as a name. We disagree. In some cases the publication of manuscript names in synonymy should be encouraged. They can provide clues to the existence of obscure specimens and manuscripts upon which the documentation of a name may have been based. For example, lack of citation of Solander's manuscript names in literature of the past has undoubtedly led to many typifications of Brown's Australian names without reference to the involvement of Solander and Banks. Brown (1810b) did not always refer to his use of his predecessors' specimens and manuscript under each species he described in his *Prodromus* (Table I, V). One of us typified *Justicia juncea* R. Br. (R. M. Barker 1986) without knowing of Solander's contribution of the epithet in the form of 'Dianthera juncea' (Table I). Brown did not cite the Banks and Solander specimen in the protologue of the *Justicia*, but because he took up Solander's epithet and presumably was influenced by Solander's concept of the species, the Banks and Solander specimen should have been considered in lectotypifying this name.

Old specimens may have a confusing array of unpublished names upon them. Some may represent the unpublished contributions of several botanists. Identification of handwriting is accordingly an important field of investigation (e.g. McGillivray 1973; Anonymous 1983), for annotations are often not accompanied by the writer's name. Sometimes a series of names may represent the developing ideas of one worker. For example, Robert Brown initially on his herbarium material and in his manuscripts applied his names *Euphrasia collina* and *E. speciosa* to different species from those in his publication (Brown l.c.) and gave other names to these two species (W. R. Barker 1982). It is important that the changing views of workers be included in taxonomic studies to avoid later confusion.

B. Authorship of botanical names: an evolving citation?

> *For the indication of the name of a taxon to be accurate and complete, and in order that the date may be readily verified, it is necessary to cite the name of the author(s) who validly published the name concerned. . .* (ICBN, Art. 46.1).
>
> *When a name of a taxon and its description or diagnosis . . . are supplied by one author but published in a work by another author, the word 'in' should be used to connect the names of the two authors. When it is desirable to simplify such a citation,* ***the name of the author who supplied the description or diagnosis is to be retained.*** (ICBN, Art. 46.2, our emphasis, see below).
>
> *When an author who validly publishes a* ***name*** *ascribes it to another person . . . the correct author citation is the name of the validating author, but the name of the other person, followed by the connecting word 'ex', may be inserted before the name of the validating author.* (ICBN, Art. 46.3; our emphasis, see below).

Authors' names are cited as part of botanical names for 'purposes of precision' (Section 3 heading preceding Art. 46). This precision can be useful in different areas. Firstly, identical names ('homonyms'), independently formulated by different authors, can be readily distinguished by their author citation. Secondly, the author citation has a bibliographic function, insofar as it represents a useful abbreviation of the full literature citation of the place of original publication (the protologue) of the name and its date. Thirdly, the *Code*

requires that the author or authors 'validly' publishing the plant name and its description be credited with authorship. Article 46.1 is possibly somewhat ambiguous in this, but 46.2 (see emphasised section) indicates clearly that the contributor of the description, not simply the author of the article, if different, is to be cited. There is no requirement that the author be mentioned in the publication itself.

Where authorship has been made clear in the protologue, the *Code* provides an easy set of guidelines to citation, quoted above. Even under these rules, however, authorship has been often wrongly attributed for many years. For example, in updating the nomenclature and taxonomy of the flora of South Australia, Eichler (1965) made many changes to long-standing author citations by applying these rules.

An example of a continuing error in citation is that of Richard Kippist's contribution to the Proteaceae. Kippist was Librarian to the Linnean Society in the mid 1800s and was keenly interested in the taxonomy of Australian plants (Mueller 1858). Kippist assisted Carl Friedrich Meisner in contributing the descriptions and often the names of at least 12 new species among the 66 Australian Proteaceae published in Meisner (1855). Many of the species were described from Drummond collections. Meisner (l.c.) had not seen Drummond's fifth set and its supplement. For these Kippist provided Meisner with 'very accurate definitions, partly accompanied with drawings and fragments, of such *Proteaceae* . . . as he found to be new. . .'. Meisner also clearly acknowledged Kippist as the sole contributor under each of these species. A year later, in his monograph in de Candolles' *Prodromus*, Meisner (1856) again omitted reference to himself as author, with citations such as 'Kipp. in Hook. . . .'. Bentham (1870b) followed suit, although generally using the ambiguous citation 'Kipp.; Meisner in Hook.'. Yet ever since the incorrect citation of the authorship of these names in *Index Kewensis* (Jackson 1893) Meisner has been consistently attributed principal authorship with 'Kippist ex Meisner'. The 12 names, in the genera *Petrophile*, *Conospermum*, *Persoonia*, *Grevillea*, *Hakea* and *Dryandra*, should all be attributed solely to Kippist's authorship. The choice of lectotype for these 15 species should be the Drummond material studied by Kippist. He studied the collections owned by Mr W. W. Saunders and compared them with those in 'several London herbaria'. The relevant *Hakea* specimens are in the Saunders herbarium at Kew; there are no fragments in the Meisner Herbarium.

Three species are described in Meisner (1855) from Drummond's fifth series under Meisner's authorship. From *Grevillea leucopteris* Meisner deliberately excluded the flowering and fruiting specimens which Kippist had described. In the case of *Persoonia striolata* Meisner supplied the name. Kippist apparently supplied its description, provisionally calling it *P. striata* R. Br. (Meisner 1856). Its authorship should accordingly be cited 'Meisner ex Kippist. . .'. In the case of *Hakea kippistiana*, Kippist indicated that Meisner had wrongly applied the name *H. teplirosperma* R. Br. to material of the species previously collected by Drummond. Kippist supplied an illustration of the fruit. It is arguable that Kippist should be treated as a joint author of *H. kippistiana*.

Dealing with cryptic authorship

This paper has highlighted evidence for a number of cryptic contributions to the publication of names. For example, Solander and Dryander have been credited inconsistently with authorship of plant names published under the name of others, their citation often dating from literature appearing soon after the protologue. Similarly, if we accept that Salisbury co-authored Knight's (1809) treatise on the Proteaceae, should not authorship of the species names be cited as 'Knight & Salisb.', *vice versa* or in some other way showing Salisbury's involvement?

The *Code* in its present form does not give clear guidance to dealing with contributors omitted from the protologue, whether they provide names, descriptive matter or both. Why the concern? Firstly, of course, a clear indication of how authorship must be determined would assist in putting the authors cited and those actually involved into a more obvious perspective. Citations are taken by many as reflecting the relative contributions of individuals to the recognition of new plants. We suggest that this would even occur were authorship demoted to a purely bibliographic role (dropping 'in' and 'ex' and their preceding authors). Secondly, authorship is an important guide to those typifying names. We have indicated in the preceding section that decisions on typifications are too often made without recourse to manuscripts and all specimens utilized by the author of the new plant.

The present rules of nomenclature regarding crediting authorship of a name to the non-publishing author using 'ex' allow for an interesting anomaly. In one situation, Gunn may suggest that Hooker name a species after his colleague Lawrence without ever communicating the binomial (genus name and species epithet). Despite this, if Hooker attributes the name to Gunn in the protologue, we have a citation 'Gunn ex Hooker'. In a second situation Solander provided the unpublished name 'Dianthera juncea' which Brown (1810b) published as *Justicia juncea*. Even if he had acknowledged Solander as provider of the epithet, Solander receives no credit in the authorship. He supplied the epithet alone, not the full 'name' (by definition the combination of the genus name and species epithet), which is required by Rec. 46E (see emphasis in quotation above) for citation as author. As a result an indication in the author citation of Solander's contribution to the publication of the species is lost.

We make two suggestions for citing 'cryptic authorship'. One involves the use of the Latin word 'apud', meaning 'in the writings of' which was in use earlier this century as an alternative to 'ex'. Mr H. K. Airy Shaw (pers. comm. 1982) also used this term in situations of complex authorship. Our suggestion is to use it in the same way as 'ex' where the preceding, in this case, unmentioned contributor to the descriptive portion of the protologue, could be dropped. Thus, where Robert Brown (1810b) had taken descriptive material from Solander, 'Solander apud R. Br.', or where Brown also contributed, 'Solander & R. Br. apud R. Br.', or, alternatively, 'Solander p.p. apud R. Br.' could apply ('p.p.' being an abbreviation for the Latin 'pro parte' meaning in part). As now, the contracted form of the citation would be 'R. Br.'. In this way author citations could be improved as knowledge of the background to

the initial publication of names important to typification comes to light.

The second approach could be the use of square brackets around cryptic authors together with 'in' and 'ex' as defined in the rules, as adopted by Mabberley (1980).

The citation of authorship of plant names can never be expected to do justice to all those involved in documentation of the plant through to publication of its name. The present rules governing author citations are variously interpreted, leading to inconsistencies. In one example we have presented, Kennedy is rarely cited in the modern literature as the author of descriptions in Andrews's *The botanical repository*, while Ker-Gawler, in a parallel case, is consistently cited as author of those in Edwards's *The botanical register*. The case of Kennedy is readily soluble, since his contribution is referred to in *Taxonomic literature* (Stafleu & Cowan 1976–88). A nomenclatural committee has been set up in an endeavour to improve the situation. Whatever recommendations it makes, determination of authorship will often remain a complex and controversial matter, particularly in the cases of old names where evidence of authorship continues to be tenuous.

VI. Conclusion

The citation of the authorship of a botanical name does not necessarily acknowledge all those involved in its foundation. Similarly, the title pages of many of the early botanical publications dealing with new Australian plants do not truly reflect major contributions by others. Many more people contributed to published names than is presently recognized. Our selection of examples demonstrates that botanists, collectors, explorers, gardeners and others associated with the documentation of the Australian flora through the collection, recognition, description, illustration and naming of new plants have been unacknowledged or overlooked.

In contrast to those overlooked are the many whose contributions to our knowledge of the Australian flora have been significantly overstated. Robert Brown, for instance, gained much of his prestige at the expense of Daniel Solander, Jonas Dryander, Richard Salisbury and Peter Good. Sir Thomas Mitchell and Captain Charles Sturt's names appear on many occasions as plant collectors, despite their expeditions having personnel whose duty it was to collect.

The right to the ideas of those in one's employ or under one's command had much to do with this unequal apportionment of credit in the literature. Solander and Dryander were employed by the patron of science Joseph Banks. Their unpublished knowledge was freely available to the scientific establishment of the day. Their successor, partly because of Banks's waning power and interest and partly because he was one of that establishment, was able to claim authorship of his own work. Brown was also able to incorporate some of Solander's and Dryander's work under his name. Major contributions to the generic classification of the Proteaceae by Richard Salisbury were bypassed in favour of Brown's more refined but later concepts by the scientific establishment.

The suppression in the botanical literature of manuscript names has left the present taxonomic community ignorant of the need to consult particular manuscripts and other evidence. Such unpublished materials and associated specimens may be important in determining the correct application of old names to plants. It is important that this unpublished evidence be made more accessible.

This paper also serves to highlight the necessity to publish results. Failure to do so in the cases of Solander, Allan Cunningham and Leichhardt has led to their results being either published by others or superseded.

With an increased awareness of Australian colonial history, critical accounts are now being prepared by historians on the activities of the explorers (e.g. Beale 1979; Webster 1980; Carter 1987; Roderick 1988). Such a searching spotlight turned on them will no doubt provide a more balanced view of the people behind the usually flattering portraits presented in their diaries, and perpetuated in scores of biographies and Australian history books. Leichhardt, traditionally portrayed as incompetent, is one who has benefited from recent investigations. Such works also give an insight into the activities of the members of the party and provide us with further background to particular collections.

We conclude by reproducing Peter Good's plea to Joseph Banks on 6 May 1801 (Edwards 1981b) just before he left for New Holland. His letter surely expresses the feelings of many knowledgeable Australian collectors who were to follow him:

> The Miner [John Allen] and I were told that we must give up every article of our discovery and collections of every kind to Mr Brown when collected to be by him labeld and stored up &c. So that it appears to me that every article of our industry and collections shall become the immediate property of Mr Brown except only so much as may be selected by the Lords of the Admiralty and also the Seeds and living plants which I understand to be wholly intended for His Majestys collection, and will entirely deprive the Miner and me from being able to present the Lords of the Admiralty with the most trifling Article or deriving any benefit from that article of indulgence. I earnestly wish an explanation on the subject, as also to know whether I will be permitted the honor of being recorded as the introducer of such plants and seeds as I shall be able to collect to introduce.

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Notes

1. Cited in Marshall (1984). Alströmer was president of the Swedish Royal Scientific Society.
2. William Anderson the horticulturist and Alexander Anderson, gardener in charge of the botanic gardens on the island of St Vincent, were also honoured by this name.
3. This practice of changing inappropriate names was by no means unique to Salisbury. Smith himself did not hesitate to advocate this when it suited, as in his preference for *Conchium* over the earlier *Hakea* (Smith 1808; Mabberley 1985), in his 'choosing the best names afforded by those writers for such species as are not altogether new' (Smith l.c.), and his preference for *Gompholobium fimbriatum* over his own earlier *G. latifolia* (Smith 1804). Brown also made many changes to names of already established genera; many of these new names were later legalized by the procedure of conservation. Examples from families other than the Proteaceae, cited above, are *Logania* which was preceded by *Enosma* Andrews published in 1808, and *Thysanotus*, which was preceded in 1808 by *Chlamysporum* Salisbury (Britten 1886a).
4. Letter, dated 6 December 1843, from Ronald Gunn to W. J. Hooker; cited in Burns & Skemp 1961.
5. Charles Greville (1749–1809) (Assistant Secretary 1942) was a close friend of Joseph Banks. He was a Lord of the Admiralty and vice-president to Banks of the Royal Society. It was to Greville that Banks wrote when he wished Peter Good to be sent as a gardener on the voyage of the *Investigator*. In addition Greville grew a number of plants which were first described in the illustrated magazines of the day. He was a founding member of the Royal Horticultural Society.
6. Banks Papers, Mitchell Library, reproduced in Currey (1967). John Lewin was a naturalist and artist whose chief collections were insects and birds (Finney 1984); he arrived in the colony in 1800 and continued to paint the flora and fauna until his death in 1819. Col. Woodford was of the War Office.
7. Dixon Library ref. ZPXX2
8. Banks Papers 18, Mitchell Library, ref. A81.
9. Letter, dated 27 May 1799, from Bass to Banks; reproduced in Bowden 1952.
10. Letter dated Jan. 1793 from Monterey, California; reproduced in Galloway & Groves 1987, p. 17.
11. Dawson Turner Catalogue 11.116–117.
12. John Lindley to Thomas Mitchell in 1837 or 1838 on two *Calostemma* species: *Mitchell papers*, vol. 6, *Miscellaneous* A295/1, p. 73, Mitchell Library.
13. The specimen is in fact the lectotype of *E. multicaulis* Bentham. Label data cited in Barker (1982, p. 189).
14. William Macarthur of Camden on Leichhardt, cited in Gilbert (1986).
15. Webster (1980) records that there were 270 goats, 108 sheep, 40 bullocks, 15 mules and 14 horses.
16. Roderick (1988) records that there were 20 mules, 6 horses and 50 bullocks.
17. In *Mitchell papers* vol. III. *1830–1839* A292, vol. VI *Miscellaneous* A295/1, Mitchell Library.
18. The attack at Mt Dispersion resulted in aboriginal deaths and prompted a highly publicized official enquiry. There are conflicting versions of what prompted the attack. In his diary and his published account (as reported in Cumpston 1954; Foster 1985; Andrews 1986), Mitchell attributed it to a defence from repeated threats of hostility by the Aborigines of the region. His men corroborated this in the subsequent enquiry. However, a later description of the aboriginal version of events recounted by Daniel George Brock (1975) in his diary of Sturt's 1844 expedition is conflicting and more sinister. According to members of the 'very tribe which were so shamefully injured by Mitchell's party', the conflict had resulted from the shooting of a female native and butchery of her child by one of Mitchell's men. The victim had approached him for the kettle which he had promised in return for sexual favours. The significance of Mitchell's modification of his diary in the days surrounding this incident, particularly with his erasure and rewriting of a large portion of his account on the fateful day, does not seem to have been considered by historians. Nor does the suppression of the wounding of an aborigine in western Victoria which concludes Mitchell's diary entry of 28 July 1836 seem to have been alluded to in the past; Mitchell's marginal comment to a person handling his text for the published version was surely not indicative of his true motives for excluding the detailed account: 'Leave this out W. Graham for fear of shocking the three old ladies'. The incident obviously was of great concern, for on that very night Mitchell buried salt, horseshoes and other articles of little anticipated use, another important event unusually and deliberately omitted from his publication. The recently published diary of Mitchell's second in command, Granville Stapylton (Andrews 1986) also contains reference to this incident (quoted here on p. 68), and indicates a general antipathy by Mitchell's party to the Aborigines. Stapylton's diary, in the Mitchell Library, is not the original (Andrews l.c.), making omissions of controversial facts possible.
19. The genus *Victoria* and its type species *V. regia* (now *V. amazonica*) are attributed to the authorship of Lindley. Lindley certainly supplied the name but he wrote (Lindley 1838) concerning the initial publication: 'At the time . . . I knew nothing of the plant beyond what could be learned from Mr. Schomburgk's description and figures'. As Lindley apparently did discuss the rank to be attributed to the plant, authorship of the species and genus should be attributed to both men, e.g. as 'Lindley ex Schomburgk & Lindley'.
20. *Mitchell papers* vol. VI *Miscellaneous* A295/1, Mitchell Library.
21. *Mitchell papers* l.c., p. 82 (undated letter).
22. *Mitchell papers* vol. III. *1830–1839* A292, p. 365. Mitchell Lirary.
23. For an account of his early life and frustrations see Farber (1985).
24. Letter reproduced in Daley 1927.
25. Quoted in Webster 1980.
26. Maxwell 2, *Hakea lasiantha* from Mt Clarence, collected on 15 July 1838, MEL 1536084.
27. An oversight, as he is mentioned elsewhere in Sturt's (1849) account. Nevertheless, Sturt's lack of knowledge of the working men of his party is discussed by Beale (1979) in a revealing analysis of his character.

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[In cases where authorship has been shown to be different from that given under the title, the published version has not been changed as authorship here has a purely bibliograhic function.]

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Appendix

Differences in pagination in the 1838 and 1839 editions of Major T. L. Mitchell's *Three expeditions to the interior of eastern Australia*

Within a year of the publication of Major Thomas Mitchell's (1838) journals of his 1831–1832, 1835 and 1836 expeditions, a revised edition (Mitchell 1839a) of the two volumes was produced. *Opinions of the press*, a fascicle of eight pages inserted at the commencement of the second edition in the library of the Botanic Gardens of Adelaide, attests to the popularity with which Mitchell's narratives may have been received. For example:

> The ability, perseverance, and zeal of Major Mitchell, whose toils, dangers, and privations were of the most trying kind, eminently justify the choice of such a man for a service of so much peril and importance ... There is no attempt at fine writing throughout these valuable pages. The descriptions are all simple, brief, and unembellished. But the matter contained in the volumes is full of interest, of a kind, too, so close and multifarious, that we could not hope to do justice to it by extracts. The scientific details are also of considerable utility, and have been arranged with great care by some distinguished friends, to whose assistance the author bears testimony in his preface. A variety of lithographs of scenes taken on the spot, diagrams, and plates illustrative of different features of natural history, increase the value of the work, which is one of the most amusing, as well as instructive, books that has been issued for many seasons from our prolific press. (*Atlas*, 15 Sept. 1838)

> Major Mitchell's work on the survey of interior Australia is the most important reference to that country that has issued from the press ... (*Morning Herald*, 12 Sept.)

The first volume and a summary and illustrations from the second volume were translated into Italian (Mitchell 1844). Little of the formal botany was included. A copy is located in the Mitchell Library.

Herbaria generally have one or other English edition but not both. Even the library at the Royal Botanic Gardens, Kew has only the second edition, together with the first volume of the first edition. Bentham (1863–1878) only had a second edition while compiling his *Flora australiensis* at Kew. The second edition was chosen by the State Library of South Australia (Mitchell 1839b) for its facsimile production.

A comparison of the two editions has shown substantial discrepancies in the pagination, which arose more through complete resetting of the type than any substantial modifications to the text. It is therefore important that these discrepancies be published to ensure correct citation.

There is also in existence a proof copy of the first edition in the Barr Smith Library, University of Adelaide (Eichler 1965). Mitchell distributed proof copies to at least some of the scientists who supplied material for the book (e.g. letter from W. Ogilvy dated 10 August 1838, return of proof corrections: *Mitchell papers* vol. III, 1830–1839 A292, pp. 454–457, Mitchell Library).

Of the 76 names appearing in the first edition of the work, 50 appear on different pages in the second. Apart from *Eucalyptus lachrymosa* (note b below), no further species were added in the second edition. All but two *Acacia* species were listed in 'A systematical list of the new plants described in this work' at the front of the first volume of the first edition; they were inserted in the second edition. The pagination of the protologues of all new names appearing in either edition is listed below.

Apart from Mitchell's *Eucarya murrayana* and *Eucalyptus lachrymosa* all species are formally named and described in Latin in a footnote to the accompanying text. Lindley is clearly cited as their author, although he attributed one name to Allan Cunningham. The published journals are largely a lightly edited version of Mitchell's diaries, housed in the Mitchell Library. Mitchell's textual references to plants were sometimes taken directly from his diaries (see Table below). More usually, however, they have been interpolated within the transcript from the diaries. Undoubtedly much information for these botanical insertions came from Lindley, but it remains to be discovered whether associated field books exist from which information written by Mitchell or his plant collector(s) could have come. There is in our experience too little information on the specimen labels for them to have been used in the insertions. Lindley's footnotes in the two editions show no differences, apart from the correction of one typographical error (Table below, note i), and an insertion by Mitchell on the flowering of *Roepera aurantiaca* at Chiswick. However, possibly in response to criticism of his style, Mitchell made many minor modifications of the text for the second edition, including those parts dealing with plants; these changes largely involved improvements in punctuation and syntax.

The publication date of the first edition was 1838, as cited on the title pages of all four first editions seen. This date is also handwritten in pencil in the second edition at Kew. It is likely that it appeared between 18 August 1838, the date of the Preface, and 1 September

1838, when the first of many reviews in the above-mentioned fascicle *Opinions of the press* appeared (ten were dated September). At least three copies were distributed before 28 August, when Sir George Murray, the former Governor of New South Wales Sir Richard Bourke, and a former military associate, Sir J. P. Hopkins thanked Mitchell for the copies he presented them (Foster 1985; *Mitchell papers* vol. III *1830–1839* A292, pp. 465–474, Mitchell Library). Bourke received his on the previous evening. On 17 August Mitchell indicated to W. Ogilvy (letter from latter of same date, in *Mitchell papers*, l.c. pp. 459–461) that the book was forthcoming. As Murray in particular is likely to have received the book immediately it was produced the likely publication date is 27 August 1838.

New species in the two editions of T. L. Mitchell's (1838, 1839a,b) *Three expeditions to the interior of eastern Australia*, with their pagination and current name, followed by notes on orthography and nomenclatural status where questionable

FAMILY Species name and author citation, spelt and punctuated as in portion of protologue in the footnotes	Volume and page number*		Mention in field diary?	Note	Current scientific name
	1st edn	2nd edn			
DILLENIACEAE					
Pleurandra incana, (Lindl.MSS.)	2,156	ditto	no	—	*Hibbertia ?riparia* (R. Br. ex DC.) Hoogl.
PITTOSPORACEAE					
Campylanthera ericoides, (Lindl.MS)	2,275	2,277	no	a	*Billardiera procumbens* (Hook.) E. Bennett
TREMANDRACEAE					
Tetratheca ciliata, (Lindl.MSS.)	2,205	2,206	no	—	*Tetratheca ciliata* Lindley
MYRTACEAE					
Baeckea crassifolia, (Lindl.MSS.)	2,114	2,115	no	—	*Baeckea crassifolia* Lindley
Baeckea alpina, (Lindl.MSS.)	2,177	2,178	no	—	*Baeckea ramosissima* A Cunn. *s. lat.*
Baeckea calycina, (Lindl.MSS.)	2,189	2,190	(yes)	—	*Thryptomene calycina* (Lindley) Stapf
Eucalyptus alpina, (Lindl.MSS.)	2,175	ditto	no	—	*Eucalyptus alpina* Lindley
Eucalyptus lachrymosa	absent	1,342	no	b	Unknown
Genetyllis alpestris, (Lindl.MSS.)	2,178	ditto	no	—	*Calytrix alpestris* (Lindley) Court
LORANTHACEAE					
Loranthus Quandang, (Lindl.MSS.)	2,69	ditto	no	e	*Amyema quandang* (Lindley) Tieghem
CAPPARIDACEAE					CAPPARACEAE
Capparis Mitchellii, (Lindl.MSS.)	1,311; also 1,284	1,315; also 1,287; 1,61	yes yes	—	*Capparis mitchellii* Lindley
VIOLACEAE					
Pigea floribunda, (Lindl.MSS.)	2,164	2,165	no	—	*Hybanthus floribundus* (Lindley) F. Muell.
MALVACEAE					
Hibiscus (*Trionum*) *tridactylites*, (Lindl. MS)	1,85	ditto	no	—	*Hibiscus trionum* L. var. *vesicarius* (Cav.) Hoehr.
Sida corrugata, (Lindl.MSS.)	2,12	2,13	no	—	*Sida corrugata* Lindley
Sida fibulifera, (Lindl.MSS.)	2,45	ditto	?yes	—	*Sida fibulifera* Lindley
EUPHORBIACEAE					GYROSTEMONACEAE
Gyrostemon pungens, (Lindl.MSS)	2,120	2,121	yes	d	*Codonocarpus cotinifolius* (Desf.) F. Muell.
RHAMNACEAE					
Cryptandra tomentosa, (Lindl.MSS)	2,177	2,178	no	—	*Cryptandra tomentosa* Lindley
RUTACEAE					
Correa leucoclada, (Lindl.MSS.)	2,39	ditto	no	—	*Correa glabra* Lindley *s. lat.*
Correa cordifolia, (Lindl.MSS.)	2,231	2,233	no	—	*Correa reflexa* (Labill.) Vent.
Correa glabra, (Lindl.MSS.)	2,48	ditto	no	—	*Correa glabra* Lindley
Correa rotundifolia, (Lindl.MSS.)	2,217	2,219	no	—	*Correa alba* Andrews var. *pannosa* Paul G. Wilson
Eriostemon pungens, (Lindl.MSS.)	2,156	ditto	no	—	*Eriostemon pungens* Lindley
Phebalium bilobum, (Lindl.MSS.)	2,177	2,178	no	—	*Phebalium bilobum* Lindley
Didimeria acmula, (Lindl.MSS.)	2,197	2,198	no	e	*Correa aemula* (Lindley) F. Muell.
ZYGOPHYLLACEAE					
Röpera aurantiaca, (Lindl.MSS.)	2,70	ditto	yes	f	*Zygophyllum aurantiacum* (Lindley) F. Muell.
GERANIACEAE					
Pelargonium Rodneyanum, (Lindl.MSS.)	2,143	2,144	no	g	*Pelargonium rodneyanum* T. L. Mitchell ex Lindley
LEGUMINOSAE PAPILIONACEAE					
Trigonella suavissima, (Lindl.MSS.)	1,253; also 2,65	1,255; also 2,65	yes yes	—	*Trigonella suavissima* Lindley
Psoralea patens, Lindl.MSS.	2,8	2,9	no	—	*Psoralea patens* Lindley
Psoralea tenax, (Lindl.MSS.)	2,9	2,10	no	—	*Psoralea tenax* Lindley
Psoralea cinerea, (Lindl.MSS.)	2,66	2,65[sic]	yes	h	*Psoralea cinerea* Lindley
Indigofera acanthoscarpa, (Lindley. MSS)	2,17	ditto	no	i	*Glycyrrhiza acanthocarpa* (Lindley) J. Black
Daviesia pectinata, (Lindl.MSS.)	2,150	2,151	no	—	*Daviesia pectinata* Lindley
Daviesia brevifolia, (Lindl.MSS.)	2,200	2,201	no	—	*Daviesia brevifolia* Lindley
Pultenaea montana, (Lindl.MSS.)	2,178	ditto	no	—	*Pultenaea scabra* R. Br. var. *montana* (Lindley) Benth.
Pultenaea mollis, (Lindl.MSS.)	2,258	2,260	no	—	*Pultenaea mollis* Lindley
Bossiaea rosmarinifolia, (Lindl.MSS.)	2,178	ditto	no	—	*Bossiaea rosmarinifolia* Lindley
Dillwynia hispida, (Lindl.MSS.)	2,249	2,251	no	—	*Dillwynia hispida* Lindley

FAMILY Species name and author citation, spelt and punctuated as in portion of protologue in the footnotes	Volume and page number*		Mention in field diary?	Note	Current scientific name
	1st edn	2nd edn			
LEGUMINOSAE CAESALPINEAE					
Cassia teretifolia, (Cunninghm.MSS.)	1,286	1,289	yes	—	*Cassia artemesioides* Gaudich.
Cassia heteroloba, (Lindl.MSS.)	2,121	2,122	no	j	*Cassia nemophila* A. Cunn. ex Vogel
LEGUMINOSAE MIMOSEAE					
Acacia leucophylla, Lindl.MSS.	2,12	2,13	(no)	k	*Acacia pendula* A. Cunn.
Acacia salicina, Lindl.MSS.	2,20	ditto	no	—	*Acacia salicina* Lindley
Acacia farinosa, (Lindl.MSS.)	2,145	2,146	no	—	*Acacia farinosa* Lindley
Acacia strigosa (Lindl.MSS.)	2,184	2,185	no	—	*Acacia aspera* Lindley
Acacia exudans, (Lindl.MSS.)	2,212	2,214	no	—	*Acacia verniciflua* A. Cunn.
Acacia furcifera, (Lindl.MSS.)	2,265	2,267	yes	—	*Acacia paradoxa* DC.
Acacia acinacea, (Lindl.MSS.)	2,265; also 2,145	2,267; also 2,146	no no	—	*Acacia acinacea* Lindley
Acacia sclerophylla, (Lindl.MSS).	2,138	2,139	no	l	*Acacia sclerophylla* Lindley
Acacia aspera, (Lindl.MSS.)	2,138	2,139	no	l	*Acacia aspera* Lindley
AMARANTHACEAE					
Trichinium alopecuroideum, Lindl.MSS.	2,12	2,13	no	—	*Ptilotus polystachyus* (Gaudich.) F. Muell.
Trichinium parviflorum, Lindl.MSS.	2,12	2,13	no	—	*Ptilotus obovatus* (Gaudich.) F. Muell. var. *parviflorus* (Lindley) Benl
Trichinium sessilifolium, Lindl.MSS.	2,12	2,13	no	—	*Ptilotus obovatus* (Gaudich.) F. Muell.
Trichinium nobile, (Lindl.MSS.)	2,23	2,22[sic]	no	—	*Ptilotus nobilis* (Lindley) F. Muell.
Trichinium lanatum, (Lindl.MSS.)	2,122	2,123	no	—	*Ptilotus obovatus* (Gaudich.) F. Muell.
CHENOPODIACEAE					
Atriplex halimoides, (Lindl.MSS.)	1,282	1,285	no	—	*Atriplex lindleyi* Moq.
Sclerolaena bicornis, (Lindl.MSS.)	2,47	ditto	no	—	*Sclerolaena bicornis* Lindley
SANTALACEAE					
Eucarya Murrayana (mihi)	2,100; also 2,121,132, 2,135; pl.36	ditto; 2,122,133, 2,137; pl.28	yes no yes	m	*Santalum murrayanum* (T. L. Mitchell) C. Gardner
[*Fusanus acuminatus*]	2,69;	ditto; also 2,137	yes yes	n	[*Santalum acuminatum* (R. Br.) A. DC.]
PROTEACEAE					
Grevillea Aquifolium, (Lindl.MSS.) (propria)	2,178	ditto	no	—	*Grevillea aquifolium* Lindley
Grevillea variabilis, (Lindl.MSS.) (propria)	2,178	2,179	no	—	*Grevillea aquifolium* Lindley
Grevillea alpina, (Lindl.MSS.) (Ptychocarpa)	2,178	2,179	no	—	*Grevillea alpina* Lindley
EPACRIDACEAE					
Leucopogon cordifolius, (Lindl.MSS.)	2,121	2,122	no	—	*Leucopogon cordifolius* Lindley
Leucopogon glacialis, (Lindl.MSS.)	2,174	2,175	no	—	*Leucopogon glacialis* Lindley
Leucopogon rufus, (Lindl.MSS.)	2,178	2,179	no	—	*Leucopogon rufus* Lindley
Epacris tomentosa, (Lindl.MSS.)	2,177	ditto	no	—	*Epacris impressa* Labill. *s. lat.*
CAPRIFOLIACEAE					
Tripetelus astralasicus	2,14	ditto	no	—	*Sambucus australasica* (Lindley) (n.gen. et sp.) Lindl. MSS. Fritsch
SOLANACEAE					
Solanum esuriale, Lindl.MSS.	2,43	ditto	yes	—	*Solanum esuriale* Lindley
Solanum ferocissimum, (Lindl.MSS.)	2,58	ditto	no	—	*Solanum ferocissimum* Lindley
CICHORACEAE					COMPOSITAE
Picris barbarorum ['Dr Lindley has favoured me with the following description']	2,344; also 2,148	2,149	yes yes	o	*Picris squarrosa* Steetz *s.lat.*
AMARYLLIDACEAE					
Calostemma candidum, (Lindl.MS.)	1,54 & 2,30	ditto	yes no	p	*Calostemma luteum* Sims
Calostemma carneum, (Lindl.MSS.)	2,39	ditto; also 2,42	yes yes	—	*Calostemma purpureum* R. Br.
LILIACEAE					
Bulbine suavis ['Dr. Lindley, who deseribes it thus']	2,270	2,272	yes	q	*Bulbine glauca* (Raf.) E. M. Watson
JUNCACEAE					
Xerotes typhina Lindl.MSS.	2,41	ditto; also 2,42	yes yes	—	*Lomandra leucocephala* (R. Br.) Ewart ssp. *robusta* A. Lee
Xerotes effusa, Lindl.MSS.	2,101	ditto	yes	—	*Lomandra effusa* (Lindley) Ewart

FAMILY Species name and author citation, spelt and punctuated as in portion of protologue in the footnotes	Volume and page number*		Mention in field diary?	Note	Current scientific name
	1st edn	2nd edn			
GRAMINACEAE					GRAMINEAE
Panicum laevinode, (Lindl.Mss.)	1,235; also 1,287	1,238; also 1,290	yes yes	—	*Panicum decompositum* R. Br.
Danthonia lappacea, Lindl.MSS.	1,309	1,313	no	—	*Astrebla lappacea* (Lindley) Domin
Danthonia pectinata, Lindl.MSS.	2,26	ditto	no	—	*Astrebla pectinata* (Lindley) F. Muell.
Danthonia eriantha, (Lindl.MSS.)	2,304	2,307	no	r	*Danthonia eriantha* Lindley
Glensine marginata, Lindl.MSS.	1,315	ditto	no	s	*Eleusine indica* (L.) Gaertner

* The first page number given is that which is considered to constitute the principal portion of the protologue, the other just being a cross-referenced brief entry by Mitchell; in the one instance where the ampersand is used, both pages appear to be as important.

Notes

a. In the footnote, Lindley referred it to two genera which he presumably considered to be synonymous: 'This has been ascertained to be a new species of the genus Campylanthera of Hooker, or Pronaya of Baron von Hugel . . .', but in the following diagnosis he makes a definite choice of generic name with: '*Campylanthera ericoides* (Lindl.MS); erecta frutieosa . . .'. This combination appears also in the 'Systematical list of the new plants described . . .' at the front of the first volume in both editions.

b. This name only appears in the second edition under the illustration, presumably by Mitchell, of a tree on the last page of the account of the 1835 expedition. The illustration appears without caption in the first edition. The name has no author citation. In the absence of any reference to the name in the botanical literature, we consider it to have been supplied by Mitchell. Since there appears to be no associated textual description, the name must be considered invalidly published. The tree looks remarkably like *Acacia pendula*! The possibility that it was meant to be '*Eucarya lachrymosa*' also arises (cf. note m)!

c. Eichler (1965) discovered the spelling of the epithet as '*Quandangus*' in a Barr-Smith Library, University of Adelaide copy of the first edition which he considered to be a proof (see discussion in text).
Mitchell left a long line in his diary where the notes on *Loranthus Quandang* were inserted in the published journal. Does this indicate the existence of a separate field book with such notes on the plants, or was it simply space for the name to be provided by his collector or botanists later examining the collection?

d. The synonymy follows Bentham (1870). George (1982) has not dealt with Lindley's name.

e. In both editions the genus is spelt '*Didimeria*' in Lindley's footnote, but '*Didymeria*' in the list of new plants. The latter spelling has been taken up in synonymy under *Correa* by Bentham (1863). However, Wilson (1961) in his revision of *Correa*, Airy Shaw (1973) and J. J. Swart in *Index nominum genericorum* (Farr *et al.* 1979) cite the former as correct, with the latter as an orthographic variant. Since the name presumably relates to the 4-merous flowers (twice twice-parted) this seems a reasonable interpretation.

f. This name appears to have been published, probably by a matter of weeks, earlier in August 1838 than Mitchell's (1838) first edition in Lindley's (1838) *Miscellaneous notes* appended to *Edwards's botanical register*. Despite the lack of a Latin diagnosis, which Lindley provided in these notes whenever publishing a new species, and the reference to the source of the name as 'Lindley in Major Mitchell's Australia, incd.', there is no doubt that, in the absence of any reference to the name being provisional on publication in Mitchell's work, the brief but reasonably detailed description in the earlier work satisfies requirements for valid publication of the name.
Added to the footnote in Mitchell's second edition is a note dated November, 1838 on the cultivation to flowering of the plant at Chiswick.

g. Because the horticultural knowledge of Richardson could have enabled him to identify this genus, even if Mitchell's could not, it is reasonable that Mitchell actually did what he said in the field, as implied,: 'We also discovered a beautiful new species of the Cape genus *Pelargonium* . . . I named it *P. Rodneyanum* . . .'. The usual author citation of 'T. L. Mitchell ex Lindley' is therefore correct in acknowledging the only certain contributor to the name. There is no reference to the plant in his diary. It is possible that this name came about at a later stage through the series of name changes surrounding '*Victoria lachrymia*' (p. 64).

h. Unless the proofs of Mitchell's first edition constitute effective publication, the available evidence indicates that this name was first published in Lindley's (1838) *Miscellaneous notes* issued with the monthly parts of *Edwards's botanical register* in August 1838. As in note f above, there is no Latin description and the species is similarly referred to Lindley's authorship in Mitchell's work, but the description is sufficient to satisfy valid publication of the name in the earlier work.

i. The genus name was not spelt out in the journal proper, both in the text reference 'an indigo' and in the footnote. However, '*Indigofera*' appears in the 'Systematical list of new plants', which forms part of the protologue.
Furthermore, in Lindley's diagnosis appears '*acanthoscarpa*', while the 'List' has '*acanthocarpa*'. In the second edition the name in the footnote was altered to '*acantho carpa*', the '*s*' being removed but the space so formed remaining. There is no doubt that '*acanthoscarpa* is a typographic error which is best corrected, although even the changes made to the newest *Code* do not at present make it mandatory.

j. Mitchell in the text: 'If new, I would name it *C. heteroloba*'. It is possible that he discussed this name with Richardson, as he did the names of topographic features with his men (see Stapylton's diary in Andrews 1986). The author citation of the species should be 'T. L. Mitchell ex Lindley'. There is no mention of this plant, let alone the name, in Mitchell's diary.

k. *Acacia pendula* is referred to by name often in Mitchell's diary.

l. These two Acacias do not appear in the list of new species, but occur, as in the second edition, at the end of chapter 6 of volume 2.

m. In the list of new plants at the beginning of the first volume the genus name is questioned: '?*Eucarya Murrayana*', but under the figure the name appears in full without question, nor is there any other indication of doubt in the accompanying text. The query may indicate that Mitchell had been given cause by Lindley or Brown to doubt the distinctiveness of his new genus. It may have linked with Brown's genus *Fusanus* which oddly follows in the list of novelties. See the section dealing with Mitchell's expeditions (p. 64) for the background to Mitchell's naming of this plant, and the tardy acceptance of the name by the botanical community.

n. This name was published much earlier by Brown (1810b) in his *Prodromus*, and yet included in Mitchell's list of new plants. See section on Mitchell's expeditions (p. 64) for Lindley's initial recognition of this as a new genus.

o. This diagnosis and that of *Bulbine suavis* (note q) are identical to those appearing in the *Miscellaneous notes* of August 1838 and June 1838 accompanying the respective monthly issues of *Edwards's botanical register*. The discourse on the *Picris* was received by Mitchell on 17 July 1838 (Mitchell 1838), possibly in the form of a proof of the *Miscellaneous notes*. The text, possibly in the form of proofs, of Mitchell's first

edition, presumably containing Lindley's other diagnoses, had already been seen by Lindley, for in the *Miscellaneous notes* he refers to *Picris barbarorum* as what is mentioned by Major Mitchell at p. 148 of the second volume of his work on Australia, as having been found by him par-boiled, as a food of the natives.

As has been recognized by previous authors (e.g. Cooke 1986; Watson 1987), the original place of publication of the two names is in the *Miscellaneous notes*.

p. Lindley has provided two complementary Latin diagnoses which appear as footnotes on the two pages cited. Contrary to Telford's (1987) citation, the protologue encompasses both pages, not just the first, from which there is in any case a cross-reference to the second.

q. Not the original place of publication. See Note o.

r. This species is referred to in the list of new plants in the first edition as occurring on page 320 of volume 2, but neither the name nor a description are located there.

s. *Glensine* appears only in Lindley's footnote in the first edition. It is clearly an error for *Eleusine*, a genus named and described by Gaertner in 1788. The latter correct spelling appears in the list of new plants in the same edition. The error was corrected in the second edition.